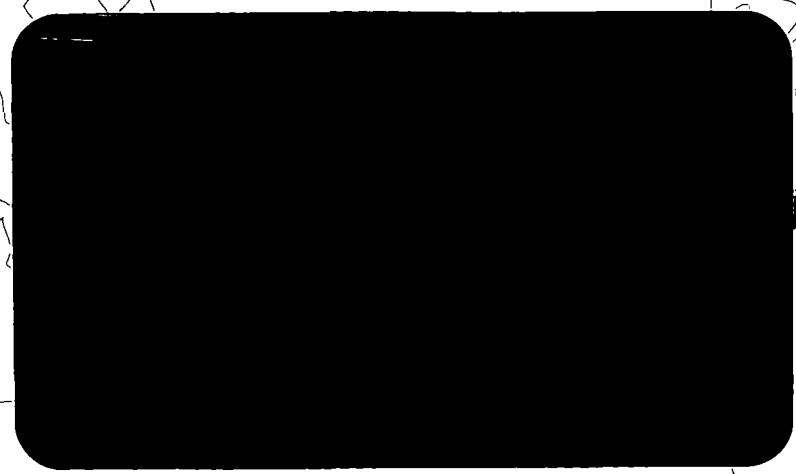


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SIMPLOT PLANT AREA  
EASTERN MICHAUD FLATS SUPERFUND SITE  
POCATELLO, IDAHO  
HEALTH AND SAFETY PLAN  
FOR  
GYPSUM STACK ROADS REMEDIAL ACTION

December 2002

*Prepared for:*

J.R. SIMPLOT COMPANY

1130 West Highway 30  
Pocatello, ID 83204

*Prepared by:*

MFG, INC.

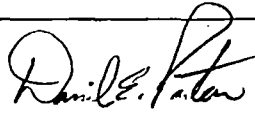
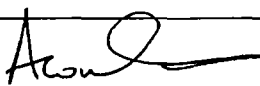
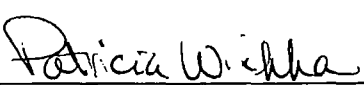
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SITE SAFETY PLAN  
FOR  
GYPSUM STACK ROADS REMEDIAL ACTION

J.R. SIMPLOT COMPANY  
1130 W HIGHWAY 30  
POCATELLO, ID 83204

MFG, INC.  
PROJECT NO. 01-0121-3

PREPARED BY:			
TITLE	NAME	SIGNATURE	DATE
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REVIEWED BY:			
TITLE	NAME	SIGNATURE	DATE
Project Manager	Andy Koulermos		12/20/02
Office Health and Safety Coordinator	Patricia Wickham		12/20/02
REVISIONS:			
DATE	NAME	APPROVED BY	DATE

SIMPLOT PLANT AREA  
EASTERN MICHAUD FLATS  
  
HEALTH AND SAFETY PLAN  
GYPSUM STACK ROADS REMEDIAL ACTION

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## LIST OF ACRONYMS

ACGIH	American Conference of Governmental Industrial Hygienists
CFR	Code of Federal Regulations
HASP	Health and Safety Plan
HEPA	High Efficiency Particulate Air
HSO	Health and Safety Officer
IDLH	Immediately Dangerous to Life and Health
MSDS	Material Safety Data Sheet
NIOSH	National Institute for Occupational Safety and Health
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
PID	Photo Ionization Detector
PM	Project Manager
PPE	Personal Protective Equipment
RPP	Respiratory Protection Program
SS	Site Supervisor
TLV-STEL	Threshold Limit Value - Short Term Exposure Limit
TLV - TWA	Threshold Limit Value - Time Weighted Average

## **1.0 INTRODUCTION**

### **1.1 Purpose of HASP**

This Health and Safety Plan (HASP) establishes policies and procedures to protect field personnel from the potential hazards associated with installation of barriers on permanent roads on the gypsum stack at the Simplot Plant Area of Eastern Michaud Flats (EMF) Superfund Site (Figure 1). This HASP assigns personnel responsibilities; prescribes mandatory operating procedures; establishes personal protective equipment requirements; and describes actions to be taken during a Site emergency. This HASP has been prepared to comply with the requirements of 29 CFR 1910.120 (b)(4).

This HASP has been prepared for the protection of MFG personnel and subcontractors during the performance of the work. Some of the field activities may be performed by Simplot personnel and contractors, without MFG personnel being present. In that event, this document will serve as guidance to Simplot for Superfund health and safety procedures.

### **1.2 Site Location and Background**

The EMF Site is located near the City of Pocatello, Idaho and includes two industrial facilities (Figure 1): the FMC Elemental Phosphorus Facility (ceased operations in December 2001) and the J.R. Simplot Don Plant. FMC produced elemental phosphorus. The Don Plant produces phosphoric acid and a variety of liquid and solid fertilizers. The EPA has divided the Site into three areas: The FMC Plant Area includes the FMC facility and adjacent land owned by FMC; The Simplot Plant Area includes the Don Plant and adjacent land owned by Simplot; and The Off-Plant Area which surrounds the FMC- and Simplot-Plant Areas.

The Simplot Don Plant covers approximately 745 acres and adjoins the eastern property boundary of the FMC facility. The main portion of the plant lies approximately 500 feet southwest of the Portneuf River. Of the 745 acres, approximately 400 acres are committed to the gypsum stack. Another 185 acres are occupied by the plant and its infrastructure. A significant portion of the remaining acreage to the south and southeast of the plant consists of cliffs and rugged steep terrain. A Union Pacific Railroad right-of-way is adjacent to the northern fence line of the Don Plant and passes through the northern

portion of the Simplot Plant Area, paralleling U.S. Highway 30. Access to the Don Plant is provided by I-86 and U.S. Highway 30.

The Don Plant began production of a single superphosphate fertilizer in 1944. Phosphoric acid production began in 1954. Currently, the plant produces 12 principal products, including five grades of solid fertilizers and four grades of liquid fertilizers. The principal raw materials for the process are phosphate ore, which is transported to the facility via a slurry pipeline from the Smoky Canyon mine, sulfur, and ammonia. The primary byproduct from the Don Plant process is gypsum (calcium sulfate) which is stacked on site.

An Administrative Order on Consent (AOC) was issued by the U.S. Environmental Protection Agency (EPA) on May 30, 1991 and entered into voluntarily by FMC and Simplot. The AOC specified requirements for implementation of a Remedial Investigation (RI) and Feasibility Study (FS) to evaluate site conditions and remedial alternatives to address any potential threats to human health and the environment. Based on the findings of these studies, EPA issued a Record of Decision (ROD; USEPA, 1998), specifying the selected remedial actions for the Site on June 8, 1998. A Consent Decree (USEPA, 2002) between EPA and Simplot, which specified the conditions for implementing the selected remedial actions in the Simplot Plant Area was entered on May 9, 2002. Initial design reports for the Simplot Plant Area remedy were submitted to EPA in early August 2002.

### **1.3 Scope of Work**

The work to be performed consists of installing a barrier comprised of a geotextile and six inches of compacted road base on permanent roads on the gypsum stack. The barriers will be installed in accordance with the project Remedial Design Report and Remedial Action Work Plan – Gypsum Stack Roads (Simplot, 2002). Areas where the barrier will be installed are shown on Figure 2.

### **1.4 Project Personnel**

The provisions of this HASP are mandatory for all MFG personnel assigned to the project. A copy of this HASP will be made available to all project personnel, contractors, subcontractors and authorized visitors that may enter the site to perform work associated with the project. Said personnel

will complete the Safety Compliance Agreement Form found in Appendix A. For the purposes of this plan the term "site" is used for the field work area, not the larger Don Plant area.

The Simplot Don Plant is an operating industrial facility, which has health and safety requirements in addition to the Superfund requirements detailed in this document (see Appendix C for a summary). Don Plant health and safety requirements must be followed at all times when working in the Simplot Plant Area.

MFG has developed a Corporate Health and Safety Program, to comply with the requirements of 29 CFR 1910.120 (MFG, 2002). The written MFG Corporate Health and Safety Program is available upon request to all MFG employees, clients, contractors and subcontractors. Relevant sections of the Corporate Health and Safety Program have been incorporated into this HASP.

#### **1.5 HASP Revisions**

The procedures presented herein are intended to serve as guidelines. They are not a substitute for the sound judgment of on-site personnel. Work conditions may change as the project progresses. As appropriate, addenda to the HASP will be provided by the Project Manager. Prompt notification of changing work conditions requiring possible modification of this HASP is the responsibility of the Site Supervisor. Additional field tasks with unique hazards or risks may also require addenda to this HASP. In any event, no changes to this HASP will be implemented without prior approval of the Site Supervisor or the Project Manager.

Appendix B of this HASP will be reserved for HASP addenda. Addenda to the HASP will be added to Appendix B as needed during the course of the project. Each person with a copy of this HASP will be provided with any addendums. A list of those persons who have a copy of this HASP will be kept by the Project Manager in the project files.

## 2.0 KEY PERSONNEL

This section describes the roles and responsibilities of key personnel relative to Health and Safety.

### 2.1 Key Organization Information

Administrative information concerning this HASP and key personnel are listed below.

Date Prepared:	November 26, 2002	
Project Title:	Gypsum Stack Roads	
MFG Project Number:	010121	
Site Address:	1130 West Highway 30 Pocatello, Idaho 83204	
Simplot On-Site Project Manager:	Dale Reavis	
Site Phone Number:	(208) 234-5476	
Cell Phone:	(208) 241-7600	
MFG Project Manager:	Andrew Koulermos	(303) 447-1823
MFG Project Engineer:	Dan Pastor	(303) 447-1823
MFG Corporate Health and Safety Director:	Patricia Wickham	(303) 447-1823
Nearest Hospital or Medical Facility:	Portneuf Medical Center (formerly Bannock Regional Medical Center) 651 Memorial Drive Pocatello, Idaho	(208) 239-1000
PLANT EMERGENCY RESPONSE SYSTEM (for all emergencies):	From Plant Phone Dial 555 From Cell Phone Dial (208) 234-5404	
National Poison Control:		(800) 222-1222
National Response Center (24 Hours):		(800) 424-8802
Centers for Disease Control:	Day Night	(404) 329-3311 (404) 329-2888

## **2.2 Organizational Responsibilities**

### **2.2.1 Project Manager**

The Project Manager (PM) will coordinate all MFG site activities for the project. The PM will have the responsibility to interface with field personnel, Simplot personnel, and any contractors and subcontractors on any health and safety issues, as appropriate. As described in the following sections health and safety issues will be handled by onsite personnel.

The PM's responsibilities include the following:

- Coordinating with the Simplot On-Site Project Manager on all aspects of the work and on Don Plant health and safety requirements.
- Providing technical input for the pre-entry briefing and tailgate safety meetings with field personnel;
- Interfacing between Simplot personnel, subcontractors and MFG regarding health and safety issues which might arise;
- Initiating occasional site audit(s), as appropriate, to verify adherence to the site safety requirements; and
- Verifying that all MFG employees under his leadership work in a safe manner according to MFG policies and this HASP.

### **2.2.2 Field Supervisor/Health and Safety Officer**

The Field Supervisor/Health and Safety Officer (FS/HSO) will be designated by the project manager and will serve as the onsite MFG personnel responsible for all health and safety activities. The FS/HSO will have the responsibility for implementation of the HASP during actual field operations performed under MFG supervision. His/her responsibilities include the following:

- Conducting the pre-entry briefing with field personnel;
- Informing personnel involved in the field operations of the proper procedures during emergencies;

- Immediately reporting any unusual or unsafe conditions;
- Verifying that all MFG employees under his leadership work in a safe manner according to MFG policies and this HASP;
- Providing a copy of the HASP to all subcontractors and third party contracts, and informing them or their representatives of any potential safety hazards that exist onsite or that may be identified during normal operations;
- Observing work party members for symptoms of overexposure or stress;
- Conducting daily tailgate safety meetings;
- Providing first aid onsite, if necessary;
- Performing site audits to verify adherence to the requirements of the HASP; and
- Modifying health and safety equipment or procedures based on data gathered at the worksite.

### **2.2.3 MFG Corporate Health and Safety Director**

The MFG Corporate Health and Safety Director will provide the following functions in support of field activities:

- Review this HASP and all addenda thereto;
- Be available for consultation with the FS/HSO;
- Modify health and safety equipment or procedures based on data gathered at the site;
- Provide review and critique of emergency response actions required during performance of field activities, if any;
- Assist the Site Supervisor in ensuring that proper health and safety equipment is available for the project; and
- Approve MFG personnel to work on the site with regard to medical examinations and health and safety training.

### **2.2.4 Contractors**

MFG subcontractors and third party contractors shall bear the ultimate responsibility for all matters dealing with safety in the performance of their work. This responsibility includes the safety of all persons and property and any and all employees of subcontractors that may perform work on their behalf.

This requirement will apply continuously regardless of time or place, and will in no way be altered because MFG personnel provide general directions as to the location where work should be performed

and/or samples taken. The contractor, their employees and any and all employees of subcontractors that may perform work on their behalf may be required to work with potentially hazardous substances. The Project Manager will, to the best of his ability, inform subcontractors or their representatives of any potential electrical, fire, explosion, health, or other safety hazards that have been identified during operations. A copy of this HASP shall be made available to all contractors working at the site.

### 3.0 TASK SAFETY AND HEALTH RISK ANALYSIS

The anticipated site activities potentially include physical, chemical and radiological hazards. The sections below discuss the hazards that could potentially be encountered during the course of the project.

#### 3.1 Physical Hazards

Physical hazards at the site can be posed by:

- Heavy Equipment;
- Trenching/Excavation;
- Heat/Cold Stress;
- Weather;
- Dangerous Animals, Insects, and Plants;
- Slip, Trip, and Fall;
- Overhead Utilities;
- Underground Utilities;
- Fire;
- Traffic; and
- Railroad Operations.

Injuries that may result from these physical hazards can range from simple slip-trip-fall types of accidents to casualties, including fatalities due to moving heavy equipment or electrocution. Injuries resulting from physical hazards can be avoided through the adoption of safe work practices and employing caution when working with machinery.

All field personnel shall be conscious of their work environment and should notify the Project Manager or other appropriate supervisory personnel of any unsafe conditions. The Field Supervisor will be responsible for informing all workers of any physical hazards related to the site. All field personnel should also familiarize themselves with other contractors safety procedures. The above mentioned physical hazards are discussed in the following sections.

### 3.1.1 Heavy Equipment

Operation of heavy equipment (graders, compactors, trucks, and dozer(s)) presents a potential physical hazard to personnel. Personal protective equipment (PPE) such as steel-toed boots, safety glasses or safety sunglasses, and hard hats should be worn whenever such equipment is present. Personnel should at all times be aware of the location and operation of heavy equipment, and take precautions to avoid getting in the way of their operation. High visibility vests may be appropriate in open areas subject to heavy equipment traffic.

### 3.1.2 Trenching/Excavation

Trenches and excavations may pose a physical hazard to site personnel. All trenching and excavation work shall comply with the requirements of 29 CFR 1926, Subpart P. No worker shall enter an excavation without ensuring that the excavation and procedures comply with 29 CFR 1926. The Contractor shall train any personnel that may enter an excavation in safe practices. Some requirements for safe trenching are:

- Whenever possible workers will not go into trenches or excavations.
- Any excavations and/or trenches exceeding five (5) feet in depth and in which personnel may be entering must be sloped, shored, braced or otherwise supported. Sloping angles and/or shoring/bracing requirements shall be determined after an inspection of the soils and conditions by a competent individual. The water content of the soil, the soil type, degree of compaction, superimposed loads and vibration can effect the stability of a trench excavation. Support systems shall be planned and designed by a qualified person.
- Excavations and trenches will be inspected by a competent person before workers enter them. Furthermore, daily inspections shall be made and trenches shall be reinspected after every rainstorm or other hazard-increasing event.
- Excavated materials (spoils) shall be stored at least two feet or more from the edge of the excavation, or otherwise retained, in order to prevent this material from falling into the excavation.
- In locations where oxygen deficiency or hazardous gaseous conditions are possible, air in the excavation or trench shall be tested. Controls shall be established to assure acceptable atmospheric conditions. When flammable gases are present, adequate ventilation shall be provided or sources of ignition shall be eliminated. Attended emergency rescue equipment, such as breathing apparatus, a safety harness and line, basket stretcher, etc., should be easily available where adverse atmospheric conditions may exist or develop in an excavation or trench. A log of all test results shall be maintained.

- When employees are required to be in trenches four feet deep or more, an adequate means of exit, such as a ladder or steps, will be provided and located no more than 25 feet from any work area.

### 3.1.3 Heat/Cold Stress

Adverse weather conditions are an important consideration when planning and conducting site operations. Hot or cold weather can cause physical discomfort, loss of efficiency, and personal injury. Whenever ambient air temperatures are above 70°F or below 50°F, the following protocols will be observed.

When air temperatures exceed 70°F, the following general practices will be followed:

- Site workers should consume sufficient fluids to remain hydrated;
- In hot weather, activities which will require the use of protective clothing will be performed in the early morning or late afternoon, when practical; and
- In hot weather, the number of workers required to wear protective clothing will be minimized, as practical.

Symptoms of heat stress are: cramping; pale or clammy skin; tiredness or weakness; headaches, nausea or dizziness; fainting; high body temperature; hot, red or dry skin; rapid, weak pulse; or unconsciousness. If symptoms of heat stress are noted for a worker, the worker will take a break in an air-conditioned building or shaded area and be given cooled drinks. The worker should rest for at least five minutes in an air-conditioned building or in the shade before resuming work.

When air temperatures are below 50°F, cold stress will be monitored for all workers. The most important factor in the prevention of cold stress is the wearing of adequate clothing. The FS/HSO will be responsible for informing all workers if their protective clothing is inadequate. In addition, when working in cold temperatures the following procedures will be observed:

- Frequent breaks or rest periods will be provided and workers will have a shelter from wind and moisture;
- Hot drinks may be provided; and
- Opportunities to change out of wet clothing or to don additional clothing will be provided.

Workers will self-monitor themselves and co-workers for signs of cold stress. Symptoms of cold stress are: shivering; numbness; low body temperature; drowsiness; and weakness. Workers with symptoms of cold stress will take at least a ten-minute break in a heated building or vehicle and drink warmed liquids (i.e., hot cocoa, soup, etc.) before resuming work.

#### **3.1.4 Weather**

It is an MFG policy that field work be conducted under safe conditions. Rain, snow and/or high wind conditions may occur during the time period of a scheduled work activity, depending upon the location of a given jobsite.

All employees will be trained in the hazards of exposure to cold and/or wet conditions. Protective clothing for wet conditions will be utilized as necessary. Heavy rains, high winds or other weather conditions may result in the cessation of site activities, at the discretion of the Project Manager or Field Supervisor.

##### **3.1.4.1 Lightning and Thunderstorms**

Outdoor operations will be suspended when lightning is within a 15 second count of the site (i.e., the time difference between seeing a lightning strike and hearing the sound). High profile equipment operation, such as drill rigs, shall be suspended when lightning is within 30 seconds of the site. Equipment operators shall stop their equipment and park it safely before heading for shelter. No personnel will be left on the ground in an exposed location. Preferred shelter during thunderstorms is a permanent building. Personnel may also take shelter in trailers or low profile rubber tired equipment (e.g., pickups). Avoid driving pickups or any other equipment, except to help evacuate personnel.

Thunderstorms always have the potential for down bursts and hail. Weather forecasts should be monitored frequently for changing weather conditions. Work may resume after a 30 minute period without lightning occurring within the 15 or 30 second count specified.

#### **3.1.4.2 Tornadoes**

The Field Supervisor will ensure that a dedicated watch is posted during periods of tornado watch or warning. Personnel will be evacuated to permanent structure when necessary. During tornado warnings, refuge should be sought in buildings under archways, tables or in closets below ground level or on the main floors. If the tornado is too close to evacuate to a permanent structure, refuge should be sought in low areas such as ditches. Field Supervisors must always be aware of changing weather conditions.

#### **3.1.4.3 Snowy Weather, Ice Storms and Blizzards**

Extra care must be taken by site workers during snowy weather. Adequate protective clothing must be donned. Site workers must be allowed rest periods in warm shelters at regular intervals. Vehicle speeds on site will be limited to below 10 mph during snowy conditions. All work shall be suspended under blizzard conditions and site workers shall immediately seek warm, sturdy shelters, such as buildings.

#### **3.1.5 Dangerous Animals, Insects, and Plants**

The Simplot Plant Area is mainly industrial in setting. In warm months, workers must be prepared for mosquitoes, ticks, chiggers, yellow jackets and other insects and for snakes. At the end of the workday, workers should check their legs and scalp for ticks or other insects.

Animal bites and insect stings are usually nuisances (i.e., localized swelling, itching, and minor pain) that can be handled with first-aid treatments. The bites of certain snakes and spiders contain sufficient poison to warrant medical attention. There are diseases that can be transmitted by insect and animal bites. Examples are Lyme disease (tick), rabies (mainly dogs, skunks and foxes), malaria, and equine encephalitis (mosquito). The greatest hazard and most common cause of fatalities from animal bites, particularly from bees, wasps, and spiders, is a sensitivity reaction. Anaphylactic shock due to stings can lead to severe reactions in the circulatory, respiratory, and central nervous systems, which can also result in death.

In addition, the project site is located in geographic area where Lyme disease and rabies are possible. Lyme disease is spread primarily by a very small tick – the deer tick. It can be found near wooded areas, tall grass and brush. Although the disease is rarely fatal, it can cause flu-like symptoms, arthritis, heart arrhythmia's, facial palsy, severe headaches, and loss of sensation. Protection against the tick consists of wearing clothing that covers the whole body, tucking pant legs into boots or socks and tucking a long-sleeve shirt into pants. A white Tyvek is recommended for protection. Use of repellents containing DEET is also effective. It is also important to frequently check for the ticks, which are about the size of a period on this page. Some warning signs include a "bull's eye" rash that may appear days to weeks after the bite, flu-like symptoms, swelling and pain in joints and, less common, heart arrhythmia, weakness in legs, facial paralysis and numbness. If employees feel they may have contracted the disease, they must notify the Corporate Health and Safety Director.

The most dangerous toxic effects from plants are due to ingestion of nuts, fruits, or leaves. Consequently, personnel are prohibited from eating any fruits, nuts, or other plant material, which may grow on the site. Of more concern to response personnel are certain plants including poison ivy, poison oak, and poison sumac, which produce adverse effects from direct contact. The usual effect is dermatitis, an inflammation of the skin. The protective clothing and decontamination procedures used for chemicals reduce the exposure risk to the plant toxins. Cleaning the skin thoroughly with soap and warm water immediately after contact will reduce risk.

### **3.1.6 Slip, Trip and Fall**

Protection from slip, trip and fall hazards will be provided through standard safety procedures including good housekeeping. Removing equipment and debris, and taking general precautions during site operations will be standard operating procedures. Workers will be apprised of any potential trip hazards through regularly scheduled health and safety meetings. Whenever possible, trip and fall hazards will be eliminated or clearly identified with yellow "caution" tape. Impalement hazards to workers will be neutralized as soon as they are identified.

### **3.1.7 Overhead Utilities**

Before site activities begin, all overhead utilities will be identified and field verified. As necessary, utilities will be deactivated, or operational procedures and site logistics will be established to

avoid overhead lines. This will be the responsibility of the contractor and will be approved by the FS. The contractor will be responsible for operation of equipment in a safe manner and follow the relevant regulations of 29 CFR 126.550. These regulations include, but are not limited to:

- All electrical equipment and lines shall be de-energized;
- Assume that all overhead lines are energized unless de-energized by the person owning the line or the electrical utility authorities indicate that it is not an energized line and it has been visibly grounded; and
- No hoisted loads shall be left unattended.

The deactivation of utilities, when necessary, should be certified by the proper utility company personnel and the certification record retained. If operation near overhead lines is necessary, Table 1 provides minimum clearance that is required for specific lines.

### **3.1.8 Underground Utilities**

Before excavation activities begin, all utilities (i.e., electricity, natural gas lines, water lines, sewer lines, etc.) should be identified and deactivated as needed. If possible, natural gas lines should be purged to remove all potentially explosive gas. The deactivation of utilities, when necessary, should be certified by the proper utility company personnel and the certification record retained. Location of the utilities and any deactivation will be the responsibility of the contractor and will be coordinated with the FS.

### **3.1.9 Fire Prevention**

Fire extinguishers shall be provided in the field vehicle and shall be available onsite. All extinguishers will be inspected, serviced, and maintained. Inspections shall be recorded on the inspection tag attached to each extinguisher.

### **3.1.10 Traffic**

Vehicle traffic will maintain a safe speed (obey the Don Plant speed limit of 15 mph) while operating on site. Occupants of any MFG vehicle shall wear seatbelts at all times. Vehicles and equipment will be equipped with the safety procedures outlined in 29 CFR 1926.601. Heavy equipment

will be equipped with an adequate audible warning device and have a reverse sign alarm audible above the surrounding noise level. Precautions will be made to warn foot traffic or other vehicles as necessary.

### **3.1.11 Railroad Operations**

Haul trucks will routinely cross the high-speed rail line and sidings at the main entrance to the Don Plant. Extreme caution shall be exercised when crossing over the tracks. All truck drivers shall receive safety training at the plant safety office before beginning any work at the site. This training will include specific procedures for crossing the rail tracks. No tracks may be blocked without a track blockage permit and the prior approval of Simplot.

## **3.2 Chemical Hazards**

Samples of the gypsum slurry (the source of the gypsum stack) were collected and analyzed during the site Remedial Investigation (RI). Analytical results for these samples are listed on Table 2.

Chemical substances in gaseous, liquid, or solid form can enter the unprotected worker by inhalation, skin absorption, ingestion, or through a puncture wound (injection). A contaminant can cause damage at the point of contact or can act systemically in different parts of the body.

Chemical exposure by inhalation is a concern since the lungs are extremely vulnerable to chemical agents. In addition, substances can pass through lung tissue into the bloodstream and onto other susceptible areas of the body. Since some toxic chemicals are not detectable by human senses, their toxic effects may not produce any immediate symptoms. Respiratory protection is therefore extremely important if there is a possibility that the worksite atmosphere may contain such hazardous substances.

The skin and eyes also represent important routes of exposure. Some chemicals directly affect the skin, while others may pass through the skin into the bloodstream where they can be transported to other vulnerable organs. Skin absorption is enhanced by abrasions, cuts, heat, and moisture. The eye is particularly vulnerable because airborne chemicals can dissolve on its moist surface and be carried to the rest of the body via capillaries located very close to the surface of the eye. Protection against skin and eye contact may be provided by:

- Wearing protective equipment (i.e., Tyvek coverall suits);
- Wearing protective safety glasses or goggles;
- Avoiding the use of contact lenses in contaminated atmospheres since they may trap chemicals against the eye surface;
- Keeping hands away from the face; and
- Minimizing contact with liquid and solid chemicals.

Inadvertent ingestion can occur as a result of personal habits such as chewing gum or tobacco, drinking, eating, smoking cigarettes, and applying cosmetics. These practices may provide a route of entry for chemicals and are restricted.

Occupational guidelines for contaminants of concern at the site are presented in Table 3. Permissible Exposure Limits (PELs) are enforceable standards promulgated by OSHA and represent the 8-hour time-weighted average above which workers may not be exposed.

Threshold Limit Values-Time Weighted Average (TLV-TWA) values are the time-weighted average concentration for a normal 10-hour workday and a 40-hour workweek, to which nearly all workers may be repeatedly exposed, day after day, without adverse effect. Threshold Limit Value-Short Term Exposure Limit (TLV-STEL) values are the concentrations to which workers can be exposed intermittently for short periods of time (15 minutes or less) without suffering from: 1) irritation; 2) chronic or irreversible tissue damage; or 3) narcosis of sufficient degree to increase the likelihood of accidental injury, impair self-rescue or materially reduce work efficiency, and provided that the daily TLV-TWA is not exceeded. TLV-TWA are established by the American Conference of Governmental Industrial Hygienists (ACGIH, 1995) and provide the basis for safety regulations of OSHA. The Immediately Dangerous to Life and Health (IDLH) limit (NIOSH, 1999) is defined as the maximum concentration of toxic substance from which escape is possible without irreversible harm should a worker's respiratory protective equipment fail.

The maximum constituent concentrations for the gypsum stack material (Table 2) were used to calculate the total dust concentration that would correspond to the OSHA PEL (Table 3), assuming 100% of the work area dust is comprised of gypsum stack solids. These calculated dust limits are shown on Table 4.

The total dust limits for each constituent were then multiplied by ten to determine the maximum dust limit for workers using respirators with a protection factor (PF) equal to ten (i.e., half-face respirator). These results are listed on Table 5 with the results sorted in order of calculated dust limits (lowest to highest). As shown, cadmium and fluoride (calcium fluoride) have the lowest dust limits, followed by beryllium, vanadium, silver, chromium, and lead. Details regarding the chemical nature of these constituents are discussed below. Additional information on these constituents is provided in Appendix E.

### 3.2.1 Beryllium

Beryllium is a hard, gray-white, brittle solid metal. It is present in residual Dewatering Pit solids at levels predicted to be of concern if exposed for many years. Routes of entry include inhalation, skin and/or eye contact, absorption, and ingestion. Symptoms of exposure include berylliosis through chronic exposure; weight loss, chest pain, cough, clubbing of fingers, cyanosis, pulmonary insufficiency, irritated eyes and dermatitis. Target organs from exposure include the eyes, skin, and respiratory system. The OSHA PEL for beryllium is  $0.002 \text{ mg/m}^3$ , averaged over an 8-hour period.

### 3.2.2 Cadmium

Cadmium is a silver-white, blue-tinged, lustrous, odorless metal, which is insoluble in water. It is a noncombustible solid in bulk form, but will burn in a powder form. Routes of entry include inhalation and ingestion. Symptoms of exposure include pulmonary edema, system cough, chest tightness, substernal pain, headache, chills, muscular aches, nausea, vomiting, diarrhea, emphysema, proteinuria, and mild anemia. Cadmium is a potential occupational carcinogen. Target organs include the respiratory system, kidneys, and blood. Occupational exposure may cause prostate and lung cancer. The OSHA Action Level for cadmium is  $0.0025 \text{ mg/m}^3$  calculated as an 8-hour time-weighted average. The OSHA PEL for cadmium is  $0.005 \text{ mg/m}^3$ .

### 3.2.3 Chromium

Chromium is a steel-gray, lustrous, odorless metal. Routes of entry include inhalation, skin and/or eye contact, and ingestion. Symptoms of exposure include irritated eyes or skin from contact and

lung damage from inhalation. Target organs from exposure include the eyes, skin, and respiratory system. The OSHA PEL for chromium metals and chromium II and III compounds is 0.5 mg/m<sup>3</sup>.

#### 3.2.4 Fluoride (Calcium Fluoride)

Fluoride is present in the Dewatering Pit solids as calcium fluoride. Calcium fluoride is a solid, white, odorless salt. Routes of entry include inhalation, skin and/or eye contact, and ingestion. Symptoms of exposure include irritated eyes or skin from contact, respiratory tract irritation or lung damage from inhalation, and digestive tract irritation with nausea, vomiting and diarrhea from ingestion. Target organs from exposure include the eyes, skin, respiratory system (lungs), kidneys, heart, and skeletal structures. The OSHA PEL for calcium fluoride is 2.5 mg/m<sup>3</sup> (as F).

#### 3.2.5 Lead

Lead in its elemental state is a heavy, gray, odorless metal, which is insoluble in water. It is a noncombustible solid in bulk form. Routes of entry include inhalation, skin absorption, skin and/or eye contact, and ingestion. Symptoms of exposure include headache, nausea, vomiting, pallor, diminished fertility, diarrhea, and kidney damage (carcinogen). Target organs from exposure include the eyes, skin, respiratory system, GI tract, central nervous system, and kidneys.

OSHA has a lead standard 29 *Code of Federal Regulations* (CFR) 1910.1025 which specifies occupational exposure limits. The OSHA Action Level for lead is 0.030 mg/m<sup>3</sup> averaged over an 8-hour period. The permissible exposure limit is 0.050 mg/m<sup>3</sup>. The potential exposures from removal activities are expected to be well below the regulated limits.

#### 3.2.6 Silver

Silver is a white, lustrous, odorless metal. Routes of entry include inhalation, skin and/or eye contact, and ingestion. Symptoms of exposure include irritated eyes, skin, or throat from contact and nasal irritation from inhalation. Target organs from exposure include the eyes, skin, and respiratory system. The OSHA PEL is 0.01 mg/m<sup>3</sup> as silver dust.

### 3.2.7 Vanadium

Vanadium is a dark-gray, odorless metal. Routes of entry include inhalation, skin and/or eye contact, and ingestion. Symptoms of exposure include irritated eyes, skin, and throat from contact, metallic taste in mouth, and cough and lung damage from inhalation. Target organs from exposure include the eyes, skin, and respiratory system. The OSHA ceiling is 0.5 mg  $V_2O_5/m^3$  (respiratory) and the NIOSH 15 minute ceiling is 0.05 mg  $V/m^3$ .

### 3.2.8 Other Contaminants of Concern At The Site

Other contaminants may be encountered during the course of the site activities. If unusual odors or conditions are encountered, personnel should suspend work activities and contact the PM or Corporate Health and Safety Director for guidance before proceeding.

### 3.2.9 Other Miscellaneous Items

The major chemical hazards have been discussed above, however, other potential chemical hazards may be encountered during site activities. One potential hazard is the use of a nuclear density gauge (which may contain a small quantity of a radioactive source material) for in-place density testing. Only a certified operator will be authorized to use the nuclear density gauge.

## 3.3 Radionuclide Hazards

### 3.3.1 Radionuclides Present at the Site

The phosphate ore used at the Don Plant contains naturally occurring radionuclides. As a result, the gypsum by product that remains after the phosphate has been extracted from the ore retains some of those radionuclides. This gypsum byproduct is the primary component of the gypsum stack where the barriers will be installed during this remedial action.

In 1997/1998, Simplot performed a gamma radiation exposure study to support remedial design. The primary goal of the monitoring program was to evaluate average exposure for gypsum stack worker

to gamma radiation over a three-month period. The study identified an average gamma radiation dose rate of 29.9  $\mu\text{R/hr}$ , based on six dosimeters placed around the dikes of the upper stack (Simplot, 1998). The need for worker protection to mitigate risks associated with radionuclide exposure is based on incremental exposure. Incremental exposure is the potential dose in excess of the background exposure caused by environmental factors other than the gypsum (i.e., native materials). Determination of a single background level for gamma radiation at the site has not been possible because the natural background levels vary from location to location, most likely depending upon the nature of the ground surface. For example, the background levels are typically higher where volcanic rock is at or near the surface than in alluvium-covered areas. During the ground survey, background levels of 12.6 to 15.8  $\mu\text{R/hr}$  were measured in the vicinity of the Portneuf River and 21 to 42  $\mu\text{R/hr}$  in the rugged Bannock Hills to the south of the Don Plant. However, for the purposes of this plan the representative background level is conservatively assumed to be 14  $\mu\text{R/hr}$ .

Samples of the gypsum solids were collected and analyzed for gross alpha and gross beta during the RI. Results of these analyses are listed on Table 2. The specific radionuclides associated with the gross alpha and gross beta activities for the gypsum solids were not identified.

Samples of surficial soils in the Off-Plant Area, which may have received fugitive emissions from the plant and gypsum stack, were collected and analyzed for radiological constituents during the RI. For the Simplot sub area of the Site, the following radionuclides were identified: lead-210, polonium-210, potassium-40, and uranium-238. The RI report evaluation assumed that the primary alpha emitters were uranium-238, uranium-234, thorium-230, radium-226, and polonium-210 and the primary beta emitters were lead-210 and potassium-40. The evaluation found that the activities of radium-226, the radioisotope of greatest concern with respect to human health and the environment, ranged from four to 25 percent of the corresponding gross alpha measurements. The Human Health Baseline Risk Assessment performed by EPA assumed that uranium-238, uranium-234, radium-226 and polonium-210 were each 25 percent of the measured gross alpha activity (EPA, 1996). In addition, the RI identified background levels for these constituents as well as gross alpha and gross beta. The background value for gross alpha (in soil) was identified as 24.7 pCi/g, and the background value for gross beta (in soil) was 31.4 pCi/g.

### 3.3.2 Regulatory Requirements/Benchmarks

Maximum occupational radiation exposure levels are established by OSHA and by EPA Radiation Protection Guidance to Federal Agencies for Occupational Exposure to Radiation.

For example, OSHA has established a Maximum Permissible Dose (MPD) for workers that should not be exceeded without careful consideration of the reason for doing so (FR Vol. 52 No. 17). For whole body exposure by workers over 18 years age, the MPD is 5,000 mrem per year (29 CFR 1910.1096). In addition, OSHA requires implementation of a formal radiation protection program where external doses have a potential to exceed 1,250 mrem per year for workers over 18 years age. Use of personal monitoring equipment (such as film badges and dosimeters) is required for workers over 18 that enter a restricted area (i.e., any area where access is controlled for the purpose of protecting individuals from exposure to radioactive materials) and may receive a dose greater than 312 mrem per quarter (whole body exposure). Limits for employee exposure to airborne radioactive constituents for workers over 18 years age are specified in Table 1 of Appendix B to 10 CFR Part 20. However, the 1971 version, not the most current, is the version enforceable by OSHA. Lower limits for all of the requirements listed above apply for workers under age 18.

The U.S. Nuclear Regulatory Commission has set an occupational dose limit of 5,000 mrem per year Total Effective Dose Equivalent (TEDE) with the requirement that doses be kept as far below a level as is reasonably achievable (ALARA). The Mine Safety and Health Administration (MSHA) regulatory dose limits are similar. Although not strictly applicable, these criteria are pertinent and have been considered in preparing this HASP.

### 3.3.3 Potential Dose/Exposure to Site Workers.

#### Evaluation of Total Dose

The estimated maximum dose to workers during installation of the road barriers was calculated based on the gross alpha concentrations in the gypsum and the measured gamma exposure rate on the gypsum stack. The pathways for exposure under normal conditions are limited to direct gamma radiation and inhalation of dust.

The direct gamma radiation dose was calculated using the measured exposure rate of 29.9  $\mu\text{R/hr}$  and an assumed background exposure rate of 14  $\mu\text{R/hr}$ . The exposure time was assumed to be 240 hours for the entire project (4 weeks x 5 days per week x 12 hours per day). The estimated maximum direct gamma dose was approximately 4 mrem.

The inhalation dose was calculated assuming an exposure time of 240 hours, a breathing rate of 1.2  $\text{m}^3/\text{hour}$ , and a dust concentration of 10  $\text{mg}/\text{m}^3$ . The dose coefficients from ICRP Publication 68 were used in the analysis. The inhalation doses were calculated for each long-lived nuclide in the uranium decay series (U-nat, Ra-226, and Th-230), assuming the entire gross alpha concentration could be attributed to that nuclide. The dose was also calculated using the average dose coefficient for the four nuclides. While other alpha emitting radionuclides may be present (e.g., Po-210), they are accounted for in the gross alpha measurement. The dose coefficients for these nuclides are lower than the Th-230 dose coefficient. Therefore, the calculation is conservative.

The maximum calculated inhalation dose was 6 mrem. That assumes all of the gross alpha is attributable to the nuclide with the highest dose coefficient, Th-230. This is a very conservative assumption.

Based on the calculated maximum direct gamma dose of 4 mrem and the calculated inhalation dose of 6 mrem, the estimated total dose for the project would be less than 10 mrem. The dose calculations for both the direct and inhalation exposures are shown in detail on Table 6. The calculated total dose is well below any action level that would trigger a requirement for radiation protection or personal monitoring.

#### Comparison to Airborne Limits

In addition, estimated maximum worker exposures to airborne radioactive material were calculated on a constituent-specific basis to allow direct comparison with the concentration limits specified in Table 1 of 10 CFR 20, Appendix B. The estimated maximum exposures were calculated for each radionuclide previously identified in the Off-Plant Area during the RI assuming a maximum dust level of 10  $\text{mg}/\text{m}^3$  and assuming the entire gross alpha or gross beta concentration could be attributed to that nuclide. The calculated maximums are compared with the 10 CFR 20, Appendix B values on Table 7.

As shown on Table 7, this very conservative analysis indicates that the maximum estimated concentration for all constituents are well below the 10 CFR 20, Appendix B values.

Therefore, based on the very conservative nature of the maximum exposure assessment and the results of the total dose calculation presented above, no requirements for worker protection or personal monitoring are specified for the work program with respect to radionuclides.

### 3.4 General Precautions

If signs of contamination different from those addressed in this HASP are encountered, such as visible soil stains or unusual odors, stop all work in the area, barricade or otherwise isolate the area, and immediately contact the Project Manager. Protection of worker health and safety shall be the first priority. Continuation of work in the area and the amount of additional personal protective equipment, if any, shall be determined by the Project Manager. Other precautions to be undertaken to provide a safe work place on this project where the potential for chemical exposure may exist include:

- No smoking, eating, or drinking in areas where contaminants may be present;
- Avoid the area immediately downwind of any activities that disturb the gypsum; and
- Contact with gypsum material should be minimized.

## 4.0 PERSONNEL TRAINING REQUIREMENTS

### 4.1 General Training

Prior to initiation of site activities, all MFG field personnel shall have completed an initial 40 hour Hazardous Materials Health and Safety Course and 8-hour annual refresher course(s), as appropriate. All field personnel shall also have a minimum of three days of actual field experience under the direct supervision of a trained, experienced supervisor.

The Site Supervisor shall have completed at least eight additional hours of specialized supervisor training as per 29 CFR 1910.120 (e)(4). All courses shall have been conducted by a qualified trainer as specified in 29 CFR 1910.120 (e)(5). These courses should cover chemical hazards, hazard recognition, hazard assessment and personal protective equipment. If necessary, the site Health and Safety Officer (HSO) will have been trained in standard first aid measures and CPR.

All personnel who may participate in the site activities shall be required to have completed appropriate training as specified in 29 CFR 1910.120 (e)(3) prior to the initiation of site activities. The supervisor-training requirement will also apply to the subcontractor supervisors. The subcontractor shall provide MFG with copies of written certificates documenting said training. Copies of training certificates for on-site personnel will be kept at the site in the possession of the PM during the performance of site activities.

Simplot personnel performing or supervising field-work have undergone safety training relevant to hazards associated with chemicals used and produced in Don Plant processes and will follow Simplot safety training guidelines and procedures when participating in the work.

### 4.2 Site Informational Programs

Prior to the initiation of each phase of field work, all MFG personnel and subcontractors who will participate in the site investigation shall attend a pre-entry briefing. The pre-entry briefing will review information contained in this HASP, including:

- Names of personnel responsible for site safety and health;
- Safety and health concerns, including physical and chemical hazards present at the site;
- Use of personal protective equipment;
- Work practices by which the employee can minimize risks from hazards;
- Engineering controls and safe use of equipment on site;
- Medical surveillance requirements, including recognition of symptoms and signs which might indicate overexposure to hazards;
- Site control measures;
- Site decontamination procedures;
- Emergency response procedures; and
- Spill containment procedures.

In addition, all persons participating in field activities shall be required to read this HASP and sign the safety compliance agreement form found in Appendix A. Information discussed at the pre-entry briefing will be reinforced, in turn, during tailgate safety meetings (see below). Additional pre-entry briefings may be required for additional phases of work or if new personnel are assigned to the project.

Tailgate safety meetings will be conducted as necessary, or whenever new personnel arrive and/or when a unique work assignment warrants employee training. Tailgate safety meetings will be conducted by the PM. These meetings will cover the projected work for the day or the specific task and will review and reinforce good safe work practices (e.g., proper protective clothing, effective deterrents of heat stress, etc.). Information discussed at the tailgate safety meetings may be revised and updated, based on any new data obtained pertaining to site characterization and analyses.

An attendance record will be kept for the pre-entry briefing and for all subsequent tailgate safety meetings. In addition to documenting the persons in attendance, these records will include the date and time of the meeting and the subjects covered. A sample safety meeting attendance form is included in Appendix D.

## 5.0 AIR MONITORING REQUIREMENTS

Air monitoring will be conducted during activities that cause disturbance of the gypsum (i.e., grading). The air monitoring program will consist of personal air monitoring. Personal air monitoring will be conducted during activities that disturb the gypsum to evaluate potential worker exposure. The frequency and method of air monitoring are discussed below. Personal air monitoring results will be recorded and a written record of the results will be maintained in the project files.

### 5.1 Personal Air Monitoring Program

Personal air monitoring will be conducted during grading or other mechanical disruption of the gypsum. The construction contractor will perform personal air monitoring based upon daily Site activities. The sampling program will monitor those individuals that are at the highest risk and that perform the duties that may involve exposure to gypsum dust. At a minimum, sampling will be performed every third day with one sample per job function that involves potential exposure to gypsum dust (i.e., grader operator or ground crew).

Personal air monitoring will consist of collecting filter samples from the worker's breathing zone using a calibrated air pump and filter cassettes. Pre-weighed PVC filters will be exposed over the full work shift, collected and shipped to an analytical laboratory for analysis of the following constituents:

- Total Suspended Particulate (TSP);
- Beryllium;
- Cadmium;
- Chromium;
- Fluoride;
- Lead;
- Silver;
- Vanadium, and
- Gross Alpha/Gross Beta.

The filter samples will be collected in general accordance with Protocol No. 1 (Appendix H). Filter analytical results will be used in conjunction with recorded flow rates from the personal sampling

pumps to calculate work shift average constituent concentrations for each worker's breathing zone. These data will be used to confirm that the levels of PPE specified in Section 6.0 have provided suitable worker protection. Calculated results will be reported to the FS and PM as soon as they are available.

## 6.0 PERSONAL PROTECTIVE EQUIPMENT PROGRAM

### 6.1 Personal Protective Equipment Program

MFG has developed and implemented a personal protective equipment (PPE) program to comply with the requirements of 29 CFR 1910.120 (g)(5). This PPE program contains procedures for:

- 1) PPE use and limitations;
- 2) PPE maintenance and storage;
- 3) PPE decontamination and disposal;
- 4) PPE training and proper fitting;
- 5) PPE donning and doffing;
- 6) PPE inspection prior to, during, and after use;
- 7) Evaluation of the PPE program effectiveness; and
- 8) Limitations during temperature extremes and heat stress, and other appropriate medical considerations.

The PPE program also includes a respiratory protection program (RPP) that complies with 29 CFR 1910.134 and EPA Order 1440.1. The RPP contains procedures for documentation of respirator fit testing. The MFG personal protective equipment program is included herein as Appendix E. Copies of OSHA training and refresher course training documentation for onsite personnel will be kept by the Project Manager in the project files.

In designating the level of PPE for the site activities, the degree of risk for the four basic routes of exposure (inhalation, skin absorption, ingestion, and eye or skin contact) to potentially hazardous substances was evaluated. When the established permissible exposure levels (PELs) are exceeded, certain procedures will be taken to reduce potential exposure. Engineering controls are to be implemented first whenever possible. When engineering controls are not possible or prove to be insufficient, PPE will be used to limit potential exposure.

## 6.2 Personal Protective Equipment Levels

The following sections describe the levels of personal protection for field work at the site. These levels are based upon the physical and chemical hazards at the site (Section 3.0), the calculated total dust levels that correspond to the applicable occupational standards/guidelines (Table 5), and site experience that total dust levels can be maintained well below  $1.3 \text{ mg/m}^3$ , as an 8 hour average, in the active excavation areas using the conventional dust control measures specified in Section 4.5 of the Remedial Action Work Plan (Simplot, 2002).

The following minimum PPE requirements will apply:

- Workers engaged in the active large-scale excavation or grading of gypsum material (grader operators, ground crew/spotters, and dozer operators) will wear Level C protection.
- Workers engaged in installing the geotextile and road base barrier or collection of in-place density samples will wear modified Level D protection.
- Support workers (supervisors, observers etc.) will wear Level D protection.

The level of personal protection worn by field personnel will be defined, controlled, and implemented by the PM. Protection may be upgraded or downgraded by the PM, as deemed necessary throughout the project.

### 6.2.1 Level C Personal Protection

- Disposable Tyvek® coveralls (exchanged when heavily soiled or after breaks, at least once per work day);
- Work gloves (disposable nitrile or cotton, depending on task);
- Steel-toe work boots (conforming to ANSI Standard Z 41.1);
- Hard hats (conforming to ANSI Standard Z 89.1);
- Safety goggles (conforming to ANSI Standard Z 87.1);
- Hearing protection (when excessive noise is present); and
- Full-face or half-face respirator with a high efficiency particulate air (HEPA) cartridge filter (conforming to ANSI Standard Z 88.2).

### 6.2.2 Modified Level D Personal Protection

Modified Level D personal protective equipment may include the following:

- Blue jeans, cotton t-shirt with 4" sleeves;
- Work gloves (disposable nitrile or cotton, depending on task);
- Steel-toe work boots (conforming to ANSI Standard Z 41.1);
- Hard hat (conforming to ANSI Standard Z 89.1);
- Safety glasses or sunglasses (conforming to ANSI Standard Z 87.1);
- Orange traffic safety vest;
- Hearing protection (when excessive noise greater than 85 dBa is present); and
- Disposable Tyvek coveralls (exchanged when heavily soiled or after breaks, at least once per work day).

### 6.2.3 Level D Personal Protection

Level D personal protective equipment is basic and includes the following:

- Blue jeans, cotton t-shirt with 4" sleeves;
- Work gloves;
- Steel-toe work boots (conforming to ANSI Standard Z 41.1); and
- Hard hat (conforming to ANSI Standard Z 89.1).

## 6.3 PPE Deviation/Modification

Protection levels may be upgraded, downgraded, or modified as deemed necessary by the FS/HSO based upon work task or site-specific, safety-related factors such as:

- When excessive noise levels exceed 85 dBa;
- Change of season/weather;
- When temperature extremes or individual medical considerations (i.e., heat stress, medication, etc.) limit the effectiveness of PPE; or
- Contaminants other than those previously identified are encountered.

#### 6.4 Limitations of PPE

PPE ensembles designated for use during work tasks have been selected to provide protection against contaminants at known or anticipated concentrations in soil or water matrices. However, no protective garment, glove, or boot is chemical-proof, nor will it afford protection against all types of chemicals. Permeation of a given chemical through PPE is a complex process governed by contaminant concentrations, environmental conditions, physical condition of the protective garment, and the resistance of a garment to a specific contaminant. Chemical permeation may continue even if a garment is resistant to a specific contaminant and may continue even after the source of contamination has been removed from the garment.

In order to obtain optimum usage from PPE, the following procedures are to be followed by all site personnel using PPE:

When using disposable Tyvek coveralls, don a clean, new garment after each rest break or at the beginning of each shift;

Inspect all clothing, gloves, and boots both prior to and during use for:

- Imperfect seams;
- Nonuniform coatings;
- Tears; and
- Poorly functioning closure.

Inspect reusable garments, boots, and gloves both prior to and during use for:

- Visible signs of chemical permeation;
- Swelling;
- Discoloration;
- Stiffness;
- Brittleness;
- Cracks;

- Any sign of puncture; and
- Any sign of abrasion.

Reusable gloves, boots, or coveralls exhibiting any of the characteristics listed above will be discarded. PPE used in areas known or suspected to exhibit elevated concentrations of contaminants will not be reused and will be discarded.

#### 6.5 Donning of PPE

A routine will be established and followed at the site for donning PPE. The procedures will be discussed in detail during the site safety meeting before starting the project and briefly during periodic site safety meetings.

Before wearing any level of PPE, it will be checked that it is in proper condition for the purpose for which it is intended. Also, workers with any minor injuries and/or openings in the skin surface, such as cuts and scratches, will be attended to in order to protect such areas which may potentially enhance exposure effects. Workers with large cuts, rashes, or other such skin damage will not be allowed to don PPE.

## 7.0 MEDICAL SURVEILLANCE REQUIREMENTS

MFG has developed and implemented a medical surveillance program to comply with the requirements of 29 CFR 1910.120 (f). This program requires annual medical monitoring (including pulmonary function evaluation) for all MFG field personnel. Records for this program are kept in compliance with the requirements of 29 CFR 1910.120. These records include:

- The name and social security number of the employee;
- Physician's written opinions, recommended limitations, and results of examinations and tests;
- Any employee medical complaints related to exposure to hazardous substances; and
- A copy of the information provided to the examining physician by the employee.

The MFG Medical Surveillance Program is reproduced in Appendix F. Subcontractors will be required to have medical surveillance programs that comply with 29 CFR 1910.120 (f).

## 8.0 SITE CONTROL MEASURES

The site control measures program is designed to minimize the exposure of personnel to potentially hazardous substances and/or situations. In this section, the term "site" refers to the immediate work area and not to the Don Plant or Simplot Plant Area. This objective will be accomplished by the establishment of work zones, the proper decontamination of personnel and equipment, and proper maintenance of safety equipment. In addition, all Don Plant health and safety requirements will be followed at all times while at the site.

### 8.1 Safe Work Practices

The following general safe work practices will apply during site activities:

- Personnel will not eat, chew gum or tobacco, smoke, take medicine or perform any other practice that increases the likelihood of hand-to-mouth transfer of potentially hazardous substances from gloves, unwashed hands or equipment.
- No one is to carry "strike-anywhere" matches or cigar/cigarette lighters.
- Personnel will stand upwind of all intrusive activities involving disturbance gypsum (e.g., excavation or grading).
- Breaks will be offered to all site workers. A five-minute break per hour may be taken by any worker, although it is not mandatory.

First aid supplies and water will be located onsite.

### 8.2 Site Security/Fencing

The site is within areas of the Don Plant that are fenced. The gypsum stack is located within the Don Plant which is fenced. Traffic access to this area is controlled by a guard office, which is manned 24-hours a day.

### 8.3 Safety Equipment Maintenance

All safety equipment will be checked on a routine basis. This equipment includes such items such as barricades, fire extinguishers, and any safety warning signs posted throughout the site.

### 8.4 Disposal of Waste

Following completion of site activities, Tyvek coveralls, gloves, respirator cartridges and other disposable items will be placed in large plastic bags for disposal by Simplot.

### 8.5 Sanitation

An adequate supply of potable water will be provided for all site workers in portable containers. Toilet and washing facilities are located at the site. The location of these facilities will be identified by the Simplot on-site representative at the initial project briefing.

## 9.0 DECONTAMINATION PLAN

### 9.1 Personnel Decontamination

Decontamination and maintenance of personal protective equipment is required for proper functioning of the equipment. At a minimum, nitrile gloves and Tyvek coveralls shall be replaced daily or after breaks; if they become damaged, they shall be replaced immediately.

The decontamination areas will be established prior to initiation of field activities, and the exact decontamination procedures will be established at that time based on field conditions, space considerations, etc. In general, dry equipment doffing procedures will be used (i.e., protective equipment will be removed and containerized without water washing). Respiratory protection equipment will be removed only after all soiled coveralls and gloves have been removed and containerized. Respirators will then be removed and cleaned with soapy water, followed by washing of hands and faces with soapy water. The above decontamination procedures apply only to activities where Level C and Modified Level D PPE are required (e.g., intrusive activities). For other activities, such as walk arounds or site visits, a less rigorous decontamination procedure may be practiced, such as a thorough dry scrubbing of boots, etc.

### 9.2 Equipment Decontamination

Equipment used to excavate or handle the gypsum materials will be decontaminated upon project completion. The decontamination of the equipment will be performed by using hand tools (shovels, dry brushes, or trowels) to remove any large accumulation of residual materials followed by rinsing of the equipment with clean water to remove any visual residuals. Rinse water will be allowed to evaporate from the decontamination area, to the extent possible. During equipment decontamination, personnel shall wear, at a minimum, Tyvek coveralls, rubber boots, nitrile gloves and safety goggles (modified Level D personal protection).

## 10.0 EMERGENCY RESPONSE/CONTINGENCY PLAN

The Don Plant is an operating industrial facility. Don Plant emergency response procedures will be followed during the project.

The required elements of an emergency response plan as specified in 29 CFR 1910.120(1) are listed below. As described in the regulation, many of these items primarily pertain to emergency responses at uncontrolled hazardous waste sites, and thus are not entirely applicable to the anticipated site activities, which do not constitute an emergency response situation. The contractor will be responsible for providing an emergency response plan for their activities. An explanation of how each plan element will be implemented at the site is provided below:

- 1) *Pre-emergency planning* - This emergency response plan will be provided to all personnel, including subcontractor personnel, working on the site during the pre-entry briefing. In addition, emergency response actions will be reviewed with all personnel during the pre-entry briefing and the tailgate safety meetings.
- 2) *Personnel roles, lines of authority, and communication* - The FS/HSO will be responsible for emergency coordination at all times. Any accidents and/or injuries shall immediately be reported to him. The FS/HSO will immediately report any accidents to the On-Site Simplot Project Manager and Don Plant Nurse.
- 3) *Emergency recognition and prevention* - Physical and chemical hazards at the site will be reviewed at the pre-entry briefing and the tailgate safety meetings.
- 4) *Safe distances and places of refuge* - Should emergency conditions arise requiring site evacuation, the FS/HSO will notify all on-site personnel immediately through the use of hand signals and verbal instructions.
- 5) *Site security and control* - Site security will be provided by the existing fence.
- 6) *Evacuation routes and procedures* - The FS/HSO will notify all on-site personnel of the need for immediate evacuation. Site evacuation will be performed in an orderly fashion under the direction of the FS/HSO.
- 7) *Emergency decontamination procedures* - In the event of a medical emergency, personnel decontamination prior to medical treatment may be omitted. Whenever possible, MFG personnel will accompany contaminated victims to the hospital to advise on matters involving decontamination. If on-site first aid is rendered and the victim does not require transport to the hospital, clothing and equipment decontamination as described in Section 8.0 will be performed after first aid measures have been performed.
- 8) *Emergency medical treatment and first aid* - Based on the severity of the injury/exposure, additional medical treatment will be obtained as described in paragraph 9 below.

- 9) Emergency alerting and response procedures - The procedures listed below will be used in the event of any site emergency:
- a) Remove any injured person(s) from immediate danger and administer first aid as needed.
  - b) Simplot has Emergency Medical Technicians (EMTs) and ambulance to transport injured persons to the hospital. The required procedure is to call 5555 on a plant phone or (208) 234-5404 on a cell phone to activate the emergency response system. If a call to 911 is needed it will be made by the plant guards or responding EMTs. The FS/HSO will carry a cell phone at all times, and the nearest phone is located at the site. Directions to the hospital are presented in Figure 2.
  - c) Notify PM before resuming work.
- 10) Critique of response and follow-up - Following any site emergency, the FS/HSO will prepare a written report for review by the PM, MFG Corporate Health and Safety Director and the client. In addition, any accidents or emergency incidents shall be reported to the relevant local, state and federal agencies by Simplot. The report will include a summary of the emergency, a description of the conditions that led to the emergency, a review of the response actions implemented following the emergency and a discussion of steps that might have been taken to prevent a recurrence of the emergency. In addition, any Simplot emergency reporting procedures will be followed. The PM will coordinate with Simplot's On-Site Project Manager on follow-up reporting.
- 11) PPE and emergency equipment - All personnel will be required to have complete Level D, and Modified Level D PPE ensembles available for use when onsite. In addition, the MFG PM will have available a first aid kit, a fire extinguisher and possibly a portable eyewash kit.

## 11.0 CONFINED SPACE ENTRY PROCEDURES

No confined space entry is anticipated during site activities.

## 12.0 SPILL CONTAINMENT PROGRAM

Potentially hazardous fluids that may be located on-site during the field activities are decontamination water and purged groundwater stored in drums. Water from decontamination efforts will be collected into drums. All containerized fluids will be clearly labeled as to their origin and date of generation. If a spill of containerized fluids occurs, the PPE level for response personnel will be modified Level D.

### 13.0 HAZARD COMMUNICATION

The Hazard Communication Act (29 CFR 1910.1200), commonly referred to as the "Worker Right to Know Act", was instituted by the Occupational Safety and Health Administration (OSHA) to reduce illness and injury caused by chemical exposure in the workplace.

#### 13.1 Material Safety Data Sheets

The Simplot Don Plant maintains a chemical inventory list of all chemicals allowed on-site. It is mandatory that any chemicals proposed to be brought on-site be reviewed and approved by the Simplot On-Site Project Manager prior to initiation of field work.

MFG will inform its employees and subcontractors of potential hazards associated with chemicals brought to the site to perform various field activities. The information will be distributed in the form of Material Safety Data Sheets (MSDSs). Copies of the MSDS for each chemical brought to the site will remain onsite during the period that the chemical is being utilized. The Don Plant also maintains MSDSs for chemicals used and generated by their process. Safe handling practices and emergency first aid for each chemical will be discussed during the pre-entry briefing, tailgate safety meetings, etc. MSDS for contaminants of concern at the site are included in Appendix E. Laboratory preservative MSDS's will be maintained in MFG's Field Notebook.

## 14.0 REFERENCES

- American Conference of Governmental Industrial Hygienists (ACGIH), 1995. *Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices for 1995-1996*. Cincinnati, OH.
- Bechtel. 1996. *Remedial Investigation Report for the Eastern Michaud Flats Superfund Site*. Bechtel Environmental, Inc. Prepared for FMC Corporation and the J.R. Simplot Company.
- MFG, Inc. 2002. *Corporate Health and Safety Program Manual*. January 2002.
- J.R. Simplot Company, 1998 *Gamma Exposure Characterization Evaluation Project (1998)*.
- Simplot. 2002. *Remedial Design Report and Remedial Action Work Plan, Gypsum Stack Roads, Simplot Plant Area, Eastern Michaud Flats Superfund Site*. Prepared by MFG, Inc. November 2002.
- U.S. Department of Health and Human Services (NIOSH), 1999. *NIOSH Pocket Guide to Chemical Hazards: DHHS (NIOSH) Publication No. 99-140*. June 1999.
- U.S. Environmental Protection Agency (USEPA) 1996. *Baseline Human Health Risk Assessment. Eastern Michaud Flats Superfund Site*. Prepared by Ecology and Environment.
- USEPA. 1998. *Record of Decision, Declaration Decision Summary and Responsiveness Summary for Eastern Michaud Flats Superfund Site*. Pocatello, Idaho, US EPA Region 10. June 1998.
- USEPA. 2002. *Consent Decree for Remedial Design/Remedial Action for the Simplot Plant Area at the Eastern Michaud Flats Superfund Site*. US EPA Region 10. May 9 2002.



## TABLES

**TABLE 1**  
**REQUIREMENTS FOR EQUIPMENT OPERATION NEAR POWER LINES**  
**(29 CFR 1926.550)**

ACTIVITY	LINE RATING	MINIMUM CLEARANCE
Equipment Operation	$\leq 50$ kV	10 feet
	$> 50$ kV	10 feet + 0.4 inches per each kV over 50kV, or 2 times the length of the line insulator (minimum of 10 feet)
In transit with no load and beam lowered	$\leq 50$ kV	4 feet
	$> 50$ kV to $\leq 345$ kV	10 feet
	345 kV to $\leq 750$ kV	16 feet

*Note: kV = kiloVolt*

Table 2

## Constituent Concentrations in Gypsum Material

Constituent	RI Gypsum Slurry Sample		Maximum Value
	HNO3 Digestion	HF/Perchlor Digestion	
Aluminum	1,180	3,240	3,240
Antimony	< 3.8	< 23.4	< 23.4
Arsenic	0.72	< 0.94	< 0.94
Barium	39.7	53.7	53.7
Beryllium	0.23	2.8	2.8
Boron	14	< 6	14
Cadmium	34.8	37.1	37.1
Calcium	233,000	243,000	243,000
Chromium	110	228	228
Cobalt	< 0.39	< 2.4	< 2.4
Copper	38.6	43.1	43.1
Fluoride	6,900	7,650	7,650
Iron	480	711	711
Lead	5.4	7.3	7.3
Lithium	0.39	< 2.4	< 2.4
Magnesium	213	301	301
Manganese	4.9	4.7	4.9
Mercury	< 0.38	< 0.11	< 0.38
Molybdenum	5.3	7.8	7.8
Nickel	25.5	42.3	42.3
Phosphorous	6,560	9,450	9,450
Potassium	1,300	2,160	2,160
Selenium	15.6	23	23
Silver	7.3	6.2	7.3
Sodium	2,090	2,400	2,400
Sulfate	540,000	601,000	601,000
Thallium	0.64	-	0.64
Vanadium	190	262	262
Zinc	211	227	227
Gross Alpha	81.7 pCi/g		81.7 pCi/g
Gross Beta	40.2 pCi/g		40.2 pCi/g

Note: Concentrations are in mg/Kg unless otherwise noted.

**Table 3**  
**OCCUPATIONAL STANDARDS/GUIDELINES FOR SITE CONTAMINANTS OF CONCERN**

STANDARD/ GUIDELINE	BERYLLIUM	CADMIUM	CHROMIUM	FLUORIDE (CALCIUM FLUORIDE)	LEAD	SILVER	VANADIUM	REFERENCE
PEL	TWA 0.002 mg/m <sup>3</sup> Ceiling 0.005 mg/m <sup>3</sup> (for 30 min) Peak 0.025 mg/m <sup>3</sup>	0.005 mg/m <sup>3</sup> (Action Level 0.0025 mg/m <sup>3</sup> )	0.5 mg/m <sup>3</sup>	2.5 mg/m <sup>3</sup>	0.050 mg/m <sup>3</sup> (Action Level 0.030 mg/m <sup>3</sup> )	0.01 mg/m <sup>3</sup>	0.5 mg/m <sup>3</sup> (as V <sub>2</sub> O <sub>5</sub> respirable dust) 0.28 mg/m <sup>3</sup> (as V)	OSHA (1999)
TLV-TWA	0.002 mg/m <sup>3</sup>	0.05 mg/m <sup>3</sup> (as dust)	0.5 mg/m <sup>3</sup>	2.5 mg/m <sup>3</sup>	0.15 mg/m <sup>3</sup>	0.1 mg/m <sup>3</sup>	0.05 mg/m <sup>3</sup> (as V <sub>2</sub> O <sub>5</sub> respirable dust) 0.028 mg/m <sup>3</sup> (as V)	NIOSH (1997)
TLV-STEL	0.01 mg/m <sup>3</sup>	-	-	-	-	-	0.05 mg/m <sup>3</sup> (as V) for 15 minute max.	NIOSH (1997)
IDLH	4 mg/m <sup>3</sup> Ca	9 mg/m <sup>3</sup> Ca	250 mg/m <sup>3</sup>	-	100 mg/m <sup>3</sup>	10 mg/m <sup>3</sup>	-	NIOSH (1997)

Note: Ca = Carcinogen

**Table 4**  
**Calculated Total Dust Limits Corresponding to Occupational Standards/Guidelines**

Constituent	Maximum Soil Concentration (mg/Kg)	Regulatory Limit OSHA PEL/Action Level (mg/m <sup>3</sup> )	Corresponding Dust Limit (mg/m <sup>3</sup> )
Aluminum <sup>2</sup>	3240	N/A	15
Antimony <sup>1</sup>	23.4	0.5	21.37
Arsenic	0.94	0.01	10.64
Barium	53.7	0.5	9.31
Beryllium	2.8	0.002	0.71
Boron <sup>2</sup>	14	N/A	15
Cadmium	37.1	0.005	0.13
Calcium <sup>2</sup>	243000	N/A	15
Chromium	228	0.5	2.19
Cobalt	2.4	0.1	41.67
Copper	43.1	1	23.20
Fluoride (Calcium Fluoride)	7650	2.5	0.33
Iron <sup>2</sup>	711	N/A	15
Lead	7.3	0.05	6.85
Lithium <sup>1,2</sup>	2.4	N/A	15
Magnesium <sup>2</sup>	301	N/A	15
Manganese	4.9	5	1020.41
Mercury	0.38	0.01	26.32
Molybdenum <sup>2</sup>	7.8	N/A	15
Nickel	42.3	1	23.64
Phosphorus <sup>2</sup>	9450	N/A	15
Potassium <sup>2</sup>	2160	N/A	15
Selenium	23	0.2	8.70
Silver	7.3	0.01	1.37
Sodium <sup>2</sup>	2400	N/A	15
Sulfate <sup>2</sup>	601,000	N/A	15
Thallium <sup>1</sup>	0.64	0.1	156.25
Vanadium <sup>3</sup>	262	0.28	1.07
Zinc <sup>2</sup>	227	N/A	15.00
Gross Alpha	81.7 pCi/g		
Gross Beta	40.2 pCi/g		

Notes: Concentrations are in mg/Kg unless otherwise noted.

<sup>1</sup> Maximum soil concentration set at detection limit if compound was not detected.

<sup>2</sup> Regulatory limits based on total dust.

<sup>3</sup> Regulatory limit based on vanadium as V.

**Table 5**  
**Total Dust Limits When Using Respiratory Protection (PF=10)**

Constituent	Maximum Soil Concentration (mg/Kg)	Regulatory Limit OSHA PEL/Action Level (mg/m <sup>3</sup> )	Corresponding Dust Limit (mg/m <sup>3</sup> )	Dust Limit for Respirator with PF = 10 (mg/m <sup>3</sup> )
Cadmium	37.1	0.005	0.13	1.3
Fluoride (Calcium Fluoride)	7650	2.5	0.33	3.3
Beryllium	2.8	0.002	0.71	7.1
Vanadium <sup>3</sup>	262	0.28	1.07	10.7
Silver	7.3	0.01	1.37	13.7
Chromium	228	0.5	2.19	21.9
Lead <sup>3</sup>	7.3	0.05	6.85	68.5
Selenium	23	0.2	8.70	87
Barium	53.7	0.5	9.31	93
Arsenic	0.94	0.01	10.64	106
Aluminum <sup>2</sup>	3240	N/A	15	150
Boron <sup>2</sup>	14	N/A	15	150
Calcium <sup>2</sup>	243000	N/A	15	150
Iron <sup>2</sup>	711	N/A	15	150
Lithium <sup>1,2</sup>	2.4	N/A	15	150
Magnesium <sup>2</sup>	301	N/A	15	150
Molybdenum <sup>2</sup>	7.8	N/A	15	150
Phosphorus <sup>2</sup>	9450	N/A	15	150
Potassium <sup>2</sup>	2160	N/A	15	150
Sodium <sup>2</sup>	2400	N/A	15	150
Sulfate <sup>2</sup>	601,000	N/A	15	150
Zinc <sup>2</sup>	227	N/A	15.00	150
Antimony <sup>1</sup>	23.4	0.5	21.37	214
Copper	43.1	1	23.20	232
Nickel	42.3	1	23.64	236
Mercury	0.38	0.01	26.32	263
Cobalt	2.4	0.1	41.67	417
Thallium <sup>1</sup>	0.64	0.1	156.25	1563
Manganese	4.9	5	1020.41	10204
Gross Alpha	81.7 pCi/g			
Gross Beta	40.2 pCi/g			

Notes: Concentrations are in mg/Kg unless otherwise noted.

<sup>1</sup> Maximum soil concentration set at detection limit if compound was not detected.

<sup>2</sup> Regulatory limits based on total dust.

<sup>3</sup> Regulatory limit based on vanadium as V.

**Table 6**  
**Calculated Maximum Radiation Dose to Workers During Remedial Actions**

I. Calculated Maximum Dose to Workers from Dust Inhalation

Assume:

5 um AMAD dust particles  
Average dust concentration = 10 mg/m<sup>3</sup>  
Average inhalation rate = 1.2 m<sup>3</sup>/hr  
Gross alpha activity concentration in bulk material = 81.7 pCi/g  
Insoluble material

Nuclide	Gr. a conc pCi/g	Est. Intake pCi/hr	Est. Intake Bq/hr	Dose Coef Sv/Bq	Exp time hr	Est. Dose Sv	Est. Dose mrem
U-nat	81.7	0.9804	0.0362748	6.30E-06	240	5.48E-05	5.48E+00
Th-230	81.7	0.9804	0.0362748	7.20E-06	240	6.27E-05	6.27E+00
Ra-226	81.7	0.9804	0.0362748	2.20E-06	240	1.92E-05	1.92E+00
Ave.	81.7	0.9804	0.0362748	5.23E-06	240	4.56E-05	4.56E+00

Estimated intake = (pCi/g)(0.01 g/m<sup>3</sup>)(1.2 m<sup>3</sup>/hr)  
Estimated intake in Bq/hr = (pCi/hr)(0.037 Bq/pCi)  
Dose Coefficients from ICRP Publication 68 (Sv/Bq)  
Dose (Sv) = (Bq/hr)(hrs)(Dose Coefficient Sv/Bq)  
Dose (mrem) = Dose (Sv) x 1E5 mrem/Sv

II. Calculated Maximum Dose to Workers from Direct Gamma Radiation:

Gypsum Stack Roads    Measured exposure rate = 29.9 uR/hr\*  
Background exposure rate = 14 uR/hr  
Net exposure rate = 16 uR/hr

Exposure = 240 hr x 16 uR/hr x 1E-3 mR/uR = 3.84 mR  
This can be assumed to be equal to approximately 4 mrem

**Table 7**  
**Calculated Maximum Worker Exposure to Airborne Radioactive Material**  
**Gypsum Stack Roads Remedial Action**

Assumptions:

Average Dust Concentration (mg/m<sup>3</sup>) 0.01

Constituent	Gypsum Concentration pCi/g	Calculated Dust Concentration <sup>(1)</sup> pCi/mL	Constituent Specific Regulatory Limit <sup>(2)</sup> pCi/mL
Alpha Emitter			
U-238	81.7	8.17E-13	7.00E-11
U-234	81.7	8.17E-13	1.00E-10
Th-230	81.7	8.17E-13	2.00E-12
Ra-226	81.7	8.17E-13	3.00E-11
Po-210	81.7	8.17E-13	2.00E-10
Beta Emitter			
Pb-210	40.2	4.02E-13	1.00E-10
K-40	40.2	4.02E-13	-

Notes:

<sup>(1)</sup> Calculated Dust Conc. (uCi/mL) = [gypsum conc. (pCi/g)][dust conc. (g/m<sup>3</sup>)]/[e-6 (uCi/pCi)][e-3 (m<sup>3</sup>/L)][e-3 (mL/L)]

<sup>(2)</sup> Based on 10 CFR 20 Appendix B, Table 1 with corrected Po-210 limits as follows:

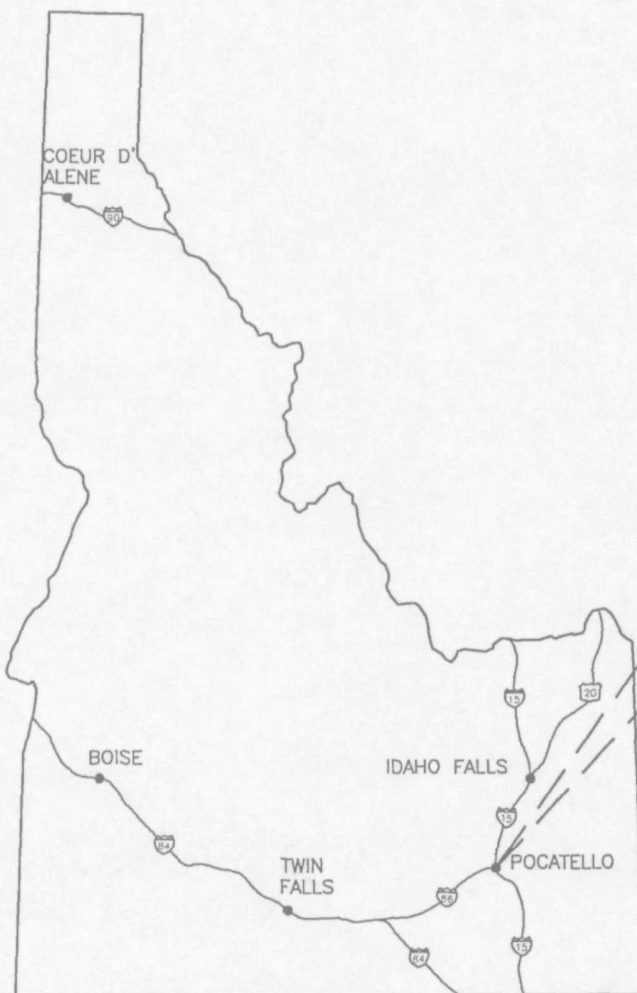
5 x 10<sup>-10</sup> (soluble)

2 x 10<sup>-10</sup> (insoluble)

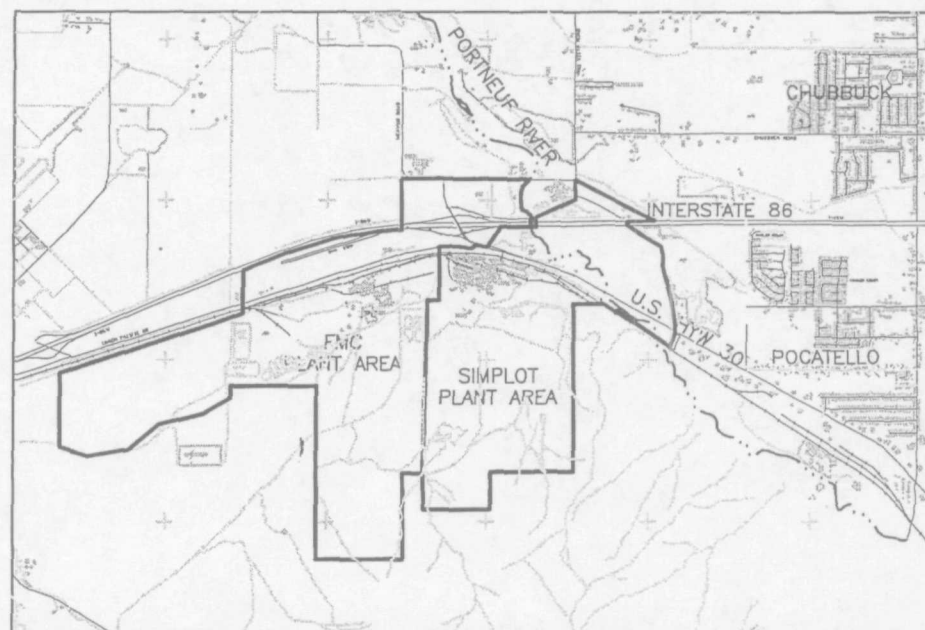
## FIGURES



**FIGURES**



IDAHO

EASTERN MICHAUD FLATS  
SUPERFUND SITE VICINITY

**SIMPLOT PLANT AREA  
EASTERN MICHAUD FLATS  
SUPERFUND SITE  
POCATELLO, IDAHO**

HEALTH AND SAFETY PLAN

FIGURE 1

**SITE LAYOUT MAP**

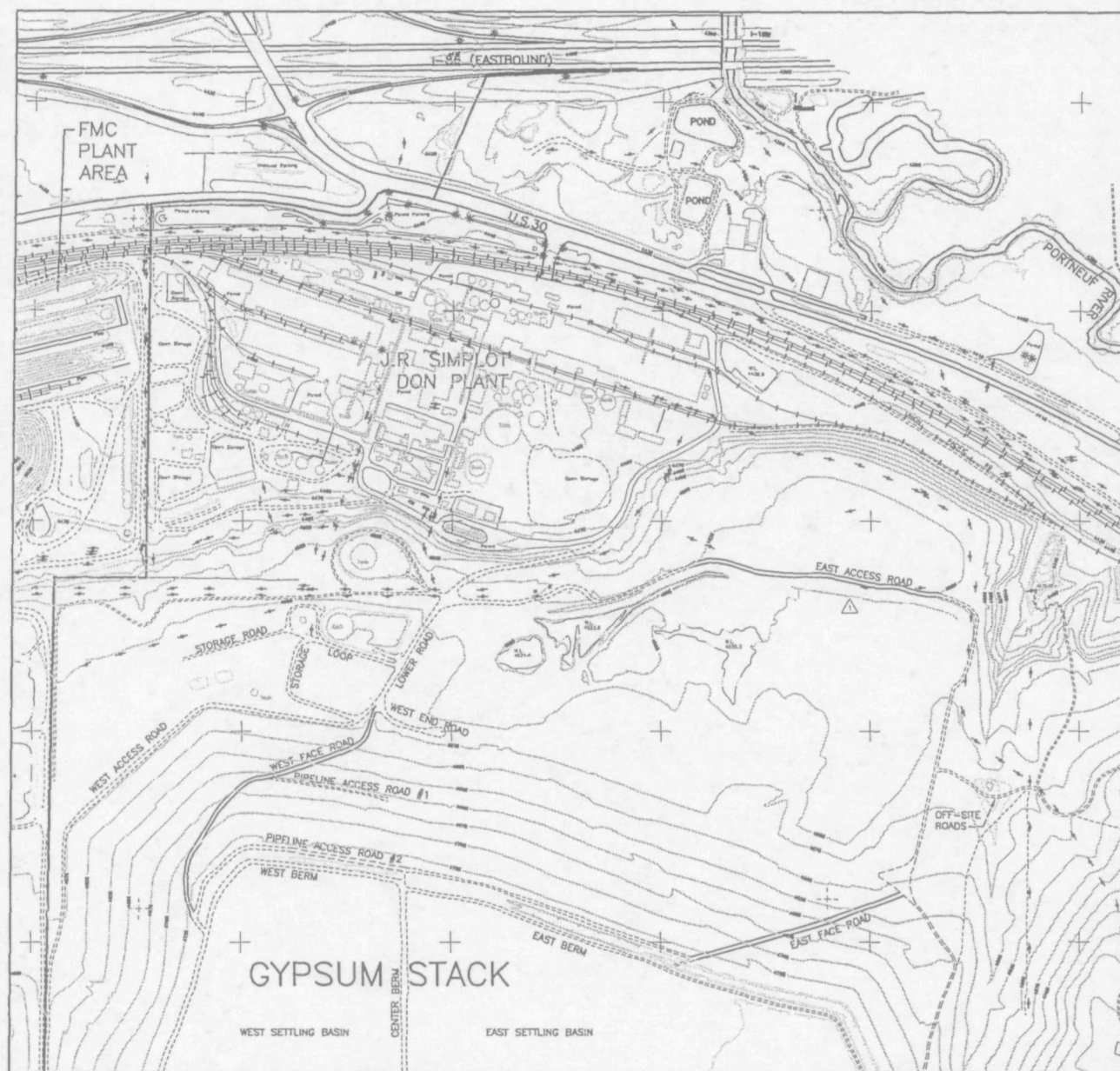
PROJECT: 010121.0 DATE: JULY 2002

REV: BY: RHF CHECKED: AC

**MFG, Inc.**

consulting scientists and engineers

WPSID 13\CS010121-3\0121C-112.dwg 000214 11/26/02 2:17 pm  
 Plot Date 11/26/02  
 Plot Scale 1:1  
 Plot Size 37.0 mm



#### LEGEND:

===== BARRIER INSTALLATION AREAS

#### NOTES:

1. CONTRACTOR MUST COMPLY WITH ALL SIMPLOT TRAFFIC AND SAFETY RULES AND REGULATIONS WHEN TRAVELING THROUGH THE DON PLANT.
2. ALL HAUL TRAFFIC MUST BE CONFINED TO DESIGNATED HAUL ROUTES.
3. GRADE BARRIER INSTALLATION AREAS. INSTALL NON-WOVEN GEOTEXTILE AND PLACE SIX INCHES OF GRAVEL ROAD BASE.



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engineers

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#### REFERENCE

- BECHTEL ENVIRONMENTAL, INC. DATE OF PHOTOGRAPHY: 2/14/82 DATE OF MAPPING: AUGUST 92 MAPPING AND PHOTOGRAPHY BY WALKER AND ASSOCIATES, INC. SEATTLE, WASHINGTON, SEATTLE, WASHINGTON

NO.	REVISIONS	BY	DATE
1	ISSUE FOR REVIEW	DLL	05/02
2	REVISED BARRIER AREAS AND SEAM/ANCHOR METHOD, REQUEST FOR REVIEW	DEP	11/02

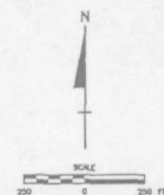
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 DRAWN BY: SCG  
 CHECKED BY: ACK  
 APPROVED BY: DEP  
 CTB: MFG-STD  
 VIEW NAME: PLAT  
 ORIGINATION DATE: 04/29/02  
 PLOT SCALE: 1:1 OR 1:2  
 DATE: MAY 2001

EASTERN MICHAUD FLATS  
 POCATELLO, IDAHO  
 SIMPLOT PLANT AREA  
 GYPSUM STACK ROADS RA

GYPSUM STACK  
 ROADS SITE PLAN

DRAWING NO. 0121C-112  
 SHEET 2 OF 3  
 REV. NO. 1

FIGURE 2



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MAPQUEST

MAPS

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## FROM:

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Pocatello, ID  
83202 US

## TO:

Bannock Regional Medical Ctr  
651 Memorial Dr  
Pocatello, ID  
83201-4004 US

Total Distance: 4.46 miles

Total Estimated Time: 9 minutes

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FASTEST ROUTE

SHORTEST ROUTE

AVOID HIGHWAYS

## DIRECTIONS

## DISTANCE



There are 0.48 miles between the end of your directions and your destination. Use maps to get from the end of your route to your destination.

1: Start out going East on US-30 E/GARRETT WAY toward US-30 W. 2.59 miles

2: Turn LEFT onto E GOULD ST. 0.10 miles

3: E GOULD ST becomes US-30 E. 0.22 miles

4: Turn SLIGHT RIGHT onto POCATELLO AVE/US-91 S/I-15 BL S. Continue to follow US-91 S/I-15 BL S. 0.88 miles

5: Turn LEFT onto E CENTER ST. 0.67 miles

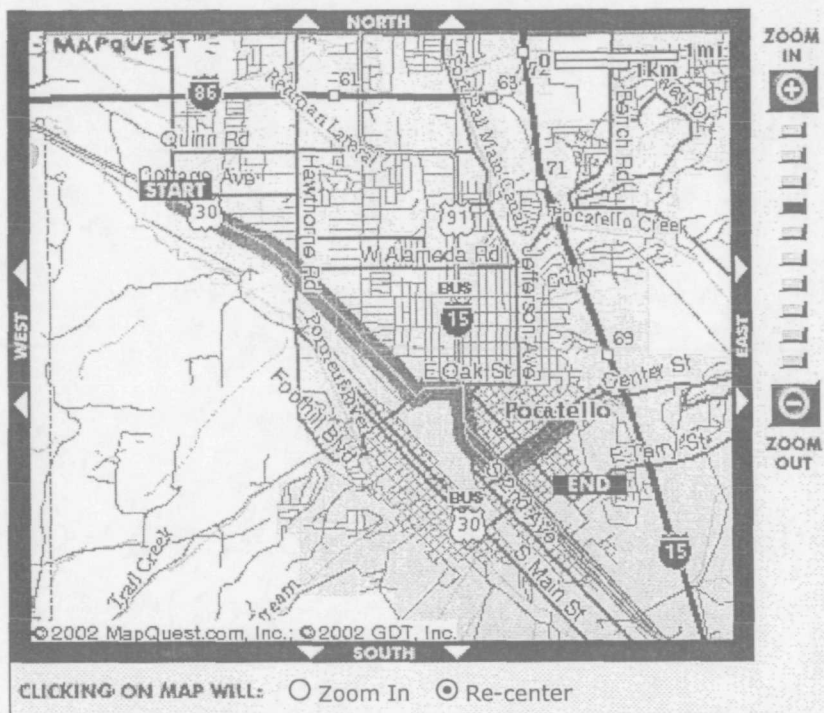
Total Estimated Time: 9 minutes Total Distance: 4.46 miles



## GET AN INSTANT PRICE

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## ROUTE OVERVIEW:



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Map Legend

**DESTINATION:**

**Bannock Regional Medical Ctr  
651 Memorial Dr  
Pocatello, ID  
83201-4004 US**



**Re-display Directions with:**

☒ Overview Map with Text    ☐ Text Only    ☐ Turn-by-Turn Maps with Text

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**APPENDIX A**  
**SAFETY COMPLIANCE AGREEMENT FORMS**

## SAFETY COMPLIANCE AGREEMENT FORM

MFG, Inc.  
Personnel Form

PROJECT NO.: 010121  
PROJECT TITLE: Simplot Plant Area Remediation  
PROJECT TASK: Gypsum Stack Roads

I have received a copy of the Site Health and Safety Plan (the "HASP") for the above referenced project.  
I have read the HASP and agree to comply with all the health and safety requirements contained therein.  
I understand that I may be prohibited from working on the project for violating any of the HASP requirements.

PRINT NAME: \_\_\_\_\_

SIGNATURE: \_\_\_\_\_ DATE: \_\_\_\_\_

NOTE: This form must be submitted to the Project Manager prior to beginning field activities.

## SAFETY COMPLIANCE AGREEMENT FORM

MFG, Inc.  
Subcontractor Form

PROJECT NO.: 010121  
PROJECT TITLE: Simplot Plant Area Remediation  
PROJECT TASK: Gypsum Stack Roads

The MFG Site Health and Safety Plan (the "HASP") provides guidance for site-specific safety requirements. It is not intended to replace any general or specific requirements of a contractor's safety program. MFG personnel will, to the best of their ability, inform contractors of any potential hazard(s) that has been identified during the field investigations. However, contractors will bear the ultimate responsibility for all matters dealing with health and safety in the performance of their appointed work. This responsibility will include, at a minimum, ensuring that their equipment is in proper working order and that their employee's and/or authorized representatives are trained and medically fit in accordance with OSHA Standards 29 CFR 1910 and 29 CFR 1926, as appropriate. The contractor is also responsible for informing its' subcontractors of these requirements.

I have received a copy of the HASP for the above referenced project. I have read the HASP and agree to comply with all the health and safety requirements contained therein. I understand that I may be prohibited from working on the project for violating any of the HASP requirements.

PRINT NAME: \_\_\_\_\_

SIGNATURE: \_\_\_\_\_ DATE: \_\_\_\_\_

AFFILIATION: \_\_\_\_\_

NOTE: This form must be submitted to the Project Manager prior to beginning field activities.

## APPENDIX B



**APPENDIX B**  
**HASP ADDENDA**

**THIS SECTION IS INTENDED TO BE BLANK AND IS RESERVED  
FOR ADDITIONAL ADDENDA TO THIS HASP**

## APPENDIX C

**APPENDIX C**

**PLANT SAFETY PROCEDURES AND REGULATIONS**

# Contractor - Please Keep Exhibit A for Your Records

## Exhibit A FOR REFERENCE ONLY

### Notice to Contractors Regarding Plant Safety Procedures and Regulations

#### J.R. Simplot Company Don Plant, AgriBusiness

P. O. Box 912, Pocatello, Idaho 83204 — 1150 W. HWY 30, 83201

The *J.R. Simplot Company* requires that *Contractors* adhere to the following established procedures and plant regulations while doing work in or on plant property ("site"). This procedure has been prepared to give *Contractors* the information needed to help the plant management administer a program of employee protection. (The use of the term "*Contractor(s)*" means: primary *Contractor* and all of their employees, *sub-Contractors* and all of their employees who work on *J.R. Simplot Company's* site.)

All *Contractors* shall provide protection for all property and employees, including those of the *J.R. Simplot Company*, in accordance with Occupational Safety and Health standards for construction (29 CFR 1926) and plant policies.

In any emergency affecting the safety of personnel or property, the *Contractor* shall (using discretion and without special instructions from Project Supervisor) immediately act to ensure the safety of such personnel or property.

Prior to starting a job on site, an indoctrinating safety meeting, will be arranged by plant supervision, and must be held between responsible members of the *Contractor's* firm and responsible plant personnel, normally the *Safety Department*. The purpose of this meeting is to familiarize the *Contractors* with plant conditions and regulations and to impress upon the *Contractor* our requirement that all work is to be done safely.

In addition to the above, if the *Contractor* makes arrangements for *sub-Contractors* to perform work on site under the *Contractor's* control, the *Simplot Safety Department* must be notified in advance. The *Contractor* must complete a 2001 Contractor Safety & Health Evaluation form for every sub-Contractor it uses on our site.

Certain defined practices apply to *all* persons on site. Rules and regulations have been established to protect employees from potential hazards existing on site, and it is important for *Contractor's* employees and *sub-Contractors* to observe these practices for their protection. The primary *Contractor* is responsible to ensure that any and all of their employees and *sub-Contractors* working on *J.R. Simplot Company's* site are properly indoctrinated and thoroughly familiarized in all plant safety requirements, plant conditions and regulations.

Violation of any safety or plant regulations will necessitate a review by the *J.R. Simplot Company* of the *Contractor's* fitness for continued work on site. Corrective action will be taken with any *Contractors* violating safety policies/procedures, up to and including termination of the contract(s).

In order to fulfill our responsibility as a user of contracted services, we must have compliance with items on this page prior to the start of any job.

The *Contractor* must furnish *J.R. Simplot Company, Don Plant Safety Department*, with a *written* copy of (including but not limited to) the following information as it applies to the job or contract:

- a) A *written* inventory list (**Exhibit C**) of all hazardous chemicals intended to be brought on site for use on the job, with Material Safety Data Sheets (MSDSs).
- b) *Written* proof of current insurance with coverages in amounts specified by the *J.R. Simplot Company* should be sent to Cheri Parker.
- c) Identify and designate a **competent** person on your crew that knows the OSHA regulations pertaining to: the safe erection of scaffolding and use, excavation, shoring procedures of trenches and foundations, regulations for the installation of barricades, confined space entry, and fall protection.
- d) *Contractors* with ten (10) or more employees working on site must have at least one (1) person designated to be in charge of safety for their company. He will be responsible for knowing and following the OSHA regulations for the construction and general industry. He must coordinate all projects with the general Project Supervisor or the plant *Safety Department*, if the Project Supervisor is not available.

# Don Plant Rules for Contractors

This plant, like other companies, has rules of conduct that are to be followed for the safety of all workers.

Listed below are rules pertaining to *Contractors* and plant personnel while on *J.R. Simplot Company's* property. The list is not intended to be all-inclusive, but does represent many areas of concern.

If you have any questions regarding these or other plant rules, please contact the *Safety Department* or your assigned project engineer.

1. Violation of *Company* rules, safety or otherwise, will not be tolerated.
2. Bringing intoxicants or narcotics into, or consuming them on *Company* premises is prohibited. Reporting to work under the influence of intoxicants or narcotics is prohibited.
3. The *Company* will not tolerate workers fighting or assaulting each other on *Company* property, including parking lots.
4. Destruction, defacing or theft of *Company* property or theft of another worker's property is prohibited. Attempted theft will be treated the same as actual theft.
5. Dishonesty or misrepresentation will not be tolerated.
6. Ignoring the job, sleeping or lying down is prohibited.
7. Non-work related materials or magazines are not permitted on site.
8. Loitering or prohibiting other workers from performing their work is prohibited.
9. Gambling, sport pools and similar activities are prohibited.
10. Workers must conduct themselves in a manner consistent with recognized order and decency. Abusive or offensive language will not be tolerated.
11. Workers must report all accidents or injuries received on the job to the plant Safety/Medical Department as soon as possible, or prior to completion of the work shift.
12. Solicitation or distribution of literature shall not be allowed on plant property at any time.
13. No firearms are to be brought onto *Company* property, including storage in locked vehicles.

# Safety Procedures and Regulations for Contractors

## 1. EMPLOYEE CONTROL

An authorized Contractor representative must furnish an up-to-date roster of all Contractor's employees, and sub-Contractors and their employees to the Security Department. Each day a complete list of the employees they have at work will be submitted to the Guardhouse when they enter the plant. The *Contractor's* supervisor must also account for the employees remaining on site after normal working hours by a like communication with the Security Department.

Authorization for admittance must be secured through the Project Supervisor at the beginning of a job. The Project Supervisor prior to the Contractor's arrival for work shall normally present such authorization to the Security Department.

*Contractor's* employees, *sub-Contractors* and their employees must remain in their designated work area and are not permitted into other parts of the plant, unless specific permission has been given.

## 2. CONDUCT

Any person(s) who appears to have been using drugs, medication or alcohol will NOT be admitted or allowed to work on site. *Contractor's* employees, *sub-Contractors* and their employees found on site under the influence of alcohol or with any alcoholic beverage in their possession, may be barred on site for one (1) year.

Gambling on *Company* property is strictly prohibited at all times. Horseplay, such as scuffling, pushing, throwing objects or similar acts, and is prohibited.

## 3. VEHICLE CONTROL

- a) Vehicle entry into the plant requires prior authorization and such vehicles are subject to inspection by the Security Department. The Project Supervisor or other designee will give the authorization. The Safety Department will issue the appropriate *Contractor's* supervisor, a tag for each of *Contractor's* authorized vehicles. If the tags expire, they may be renewed with the Safety Department. The *Contractor* will be responsible to see that the identifying tags are placed **only** in the authorized vehicles, and are to be hung on vehicle's rear view mirror facing outside. It will be the *Contractor's* responsibility to have proper insurance coverage for all vehicles in which they place tags. Authorized vehicles are only those vehicles that are absolutely needed on site, by the *Contractor*, to carry out their respective duties. Personal vehicles are not authorized to be on site.

# Safety Procedures and Regulations for Contractors

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FOR REFERENCE ONLY

b) **ALL vehicles must make a COMPLETE STOP at ALL RAILROAD TRACKS.**

- At the main plant entrance, when the rail crossing signals are flashing, **STOP** and wait for the crossing arms to descend. **DO NOT ever attempt to cross the tracks once the signals are activated!** When a train is approaching, a warning bell and flashing lights will begin and continue until the train has cleared the crossing.
- **Twenty-five (25) seconds after** the warning bell and light, the guard arms will lower to prevent crossing.
- **Twenty (20) seconds after** the guard arms are lowered; the train will be at the crossing. In addition to the above system, signs have been installed at either side of the crossing indicating, "***Do not proceed if lights are flashing. Cross arms will come down.***"
- Make sure you have ample room for your entire vehicle to cross **before** you ever start across the tracks. **DO NOT EVER stop on the tracks**, continue all the way across. Even with the information signs and the warning signals provided, incidents continue to occur where drivers and pedestrians violate instructions and warnings. State law prohibits crossing when warning signals are in operation on crossings with crossing arms.

c) **ALL vehicles MUST make a complete stop at ALL "STOP" signs.**

- d) The speed limit for motor vehicles on site is **15 miles per hour**. *Contractor's* drivers must observe this speed limit and drive carefully, always being on the alert for pedestrians and other vehicles.
- e) All personnel and vehicles are subject to search. A notice posted at the Guardhouse is printed below:

*"All personnel and visitors are subject to search of any packages, lunch pails or other carried items entering or exiting from this plant. All vehicles are also subject to search when entering or exiting from this plant."*

*"All searches will be conducted by the Simplot Security personnel and we ask that you cooperate with the security personnel to help ensure everyone's protection."*

4. **EQUIPMENT SECURITY**

*Contractors* must keep their tool shed and toolboxes locked at the end of each work day and are not to leave tools lying around in operating areas. *J.R. Simplot Company* accepts no responsibility for lost or stolen tools.

5. SMOKING REGULATIONS

Smoking is NOT permitted in any building or certain posted areas on site. It may be necessary to designate a smoking area for *Contractor's* employees, *sub-Contractors* and their employees.

6. INSPECTIONS

- a) Routine safety inspections of the *Contractor's* work site will be noted and recorded by the Project Supervisor and the Safety Department. The *Contractor* will be notified of any safety violations that require correction. The safe work performance of *Contractors* will be utilized in determining whether or not a *Contractor* is awarded future work with the *J.R. Simplot Company*.
- b) The Project Supervisor and Environmental Support will do routine environmental compliance inspections of Contractor areas and work sites. Violations of plant environmental rules and local, State, and/or Federal regulations will be noted and recorded. The *Contractor* will be notified of any compliance violations that require correction. The compliance performance of *Contractors* will be utilized in determining whether or not a *Contractor* is awarded future work with the *J.R. Simplot Company*.

7. LOCK OUT/TAG OUT POLICIES AND PROCEDURES

In order for a *Contractor* to work on any equipment or machinery on site, the *Contractor* will be required to review and use the *J.R. Simplot Company's, Don Plant, Pocatello, Idaho, "Lock Out/Tag Out Policies and Procedures"*. (If the *Contractor* has a set of *written* guidelines, those guidelines will have to meet or surpass *Simplot's* requirements and will have to be reviewed and approved by the *Safety Department* before work begins.)

The *Contractor* will be required to:

- I. Lock out/tag out all equipment worked on, using the locks, tags and adapters that meet *J.R. Simplot Company's, Don Plant, Pocatello, Idaho* standards.
- II.
  - a) Understand the proper equipment, pipes, etc. to be locked out and drained of energy.
  - b) Review the prints and drawings with the *Simplot* Project Supervisor to make sure the right equipment, pipes, etc., are secured.

8. HAZARD COMMUNICATION

The **Contractor** shall provide the **Safety Department** with a *written* inventory list (**Exhibit C**), Material Safety Data Sheets (MSDSs), and other appropriate information for all potential hazardous materials brought on site and used by their employees or *sub-Contractors*. All **Contractors** employees and *sub-Contractors*, while working at the **J.R. Simplot Company, Don Plant**, Pocatello, Idaho must comply with the OSHA "Right to Know" Hazardous Chemicals Communication Law.

The law was established to protect people from chemical exposure and in case of accidental exposure to show people where to find information on procedures to follow that eliminate and/or minimize any injuries from that exposure.

**I. Information contained on MSDS (Material Safety Data Sheets)**

The MSDS is broken down into sections as follows:

Section 1	Identification (name of chemical)
Section 2	Hazardous ingredients
Section 3	Component hazard data (physical data)
Section 4	Fire and explosion data
Section 5	Reactivity
Section 6	Health hazard data
Section 7	Sills and leaks
Section 8	Special protection
Section 9	Special precautions

FOR REFERENCE ONLY

**II. All chemicals used at the Don Plant, Pocatello, Idaho must have a MSDS label on them showing their name and number.**

**III. MSDS sheets are available on our Don Plant Web site (intranet) OR in the Document Control Center.**

**9. EYE PROTECTION, SAFETY HATS AND SAFETY BOOTS (PPE)**

Eye protection, safety hats and work boots must be supplied and worn by all **Contractor's** employees, *sub-Contractors* and their employees working in the plant's operating areas at all times, in the offices and other areas as the nature of the work requires. Determination of these requirements will be the responsibility of the plant Safety Manager's office.

**Eye Protection:** Approved safety glasses with side shields are required in all operating areas of the plant. Due to hazards of mists, fumes, blowing dust, etc., no contact lenses are permitted. **Dark lenses are not permitted in any building.**

**Safety Hats:** Approved hard hats must be worn in all operating areas of the plant.

**Safety Boots:** Steel-toed leather shoes with a minimum of six-inch (6") height are required in all operating areas of the plant.

**General Clothing Requirements:**

Minimum shirt accepted is a tee shirt with sleeves.

No cut-offs or shorts are allowed.

**10. RESPIRATORY PROTECTION**

The *Contractor* shall provide their own respiratory protection equipment and maintain a respiratory protection program as required by Federal Regulation 29 CFR 1910.134 and/or recommended by plant *Safety Department*.

All Contractors' personnel must be fit tested and trained prior to being permitted to use any respirator. Personnel using a respirator must have a valid fit test record in their possession to verify that training and proper instructions have been provided. All personnel working in plant operating areas must be clean-shaven where the standard respirator seal area would contact their face.

**11. CLEANING OF JOB SITE**

The *Contractor* shall keep the job site clean and free from rubbish, scrap, etc., at all times during the progress of the work and shall remove rubbish as often as directed by the *Simplot* Project Supervisor.

At the close of their work, *Contractors* must clean and repair any adjacent work areas that have been damaged or marred by the operations, and leave the premises clean as far as their work is concerned. In case of dispute, *J.R. Simplot Company* may remove rubbish at *Contractor's* expense. The *Contractor* will be given notice prior to removal of rubbish or similar materials.

Nails must be removed or bent over on all boards and crating materials that are not immediately removed from the job site. Milk cartons, drinking bottles or cups, food scraps, cigarette butts, etc., must be cleaned up daily.

**12. SANITARY FACILITIES**

The *Simplot* Project Supervisor in charge of each project will arrange for sanitary and toilet facilities for the *Contractor's* personnel to use. It is understood that only assigned facilities will be used by *Contractor's* personnel.

**13. UTILITIES (Electric Light, Power, Steam, Water, Telephone and Fuel)**

The *Contractor* shall make no connection, either temporary or permanent, to any service line of electric power, steam, water or fuel without specific approval of the *Simplot* Project Supervisor. Specific precautions may be necessary.

Existing underground and overhead utilities, communication and fire alarm services will be located for the *Contractor* by the *Simplot* Project Supervisor. *Contractors* shall protect these utilities and services from damage to prevent possible accident or loss of fire protection and communication services.

**14. VALVES AND PIPELINES**

*Contractor's* personnel shall not operate a valve, switch or open a pipeline without specific approval and in the presence of the *Simplot* Project Supervisor. The Area Manager may make exceptions to this regulation for temporary periods.

**15. FIRE PROTECTION****a) Permit for Welding, Open Flames, etc.**

For each shift and each location, the *Contractor's* personnel shall obtain a permit from supervision for open flames or arc cutting, burning, welding, working on live electrical wires or other apparatus producing open flames or sparks capable of acting as a source of ignition. Special fabricating areas or new construction would not necessarily require a permit; the *Simplot* Project Supervisor concerned must approve all arrangements of this nature.

**b) Notification of Intent**

The *Contractor's* personnel shall obtain approval from the Safety Department whenever their work will entail shutting off a water main, shutting off or using water from a fire hydrant, blocking a roadway so that fire fighting equipment cannot pass, blocking access to fire equipment or hydrant and/or blocking, removing or changing any exit or fire escape.

**c) Fire Extinguishers**

It is the responsibility of the *Contractor* to maintain in temporary offices, tool rooms or storage rooms assigned to them, a fire extinguisher for placement in the immediate vicinity of each job involving welding, burning, open flame, etc. *Contractor's* employees must not remove *J.R. Simplot Company's* fire extinguishers from their designated stations, except under emergency conditions.

**d) Fire Watchers**

*Contractor's* employees may be assigned as firewatchers as required by the particular work in progress. Firewatchers must carefully follow instructions as set forth by the *Simplot* Project Supervisor. The fire watcher must be fully trained in responding to

incipient stage fires, know the proper use and limitations of portable fire extinguishers, and how to report a fire using the *Don Plant* Emergency Response System (extension 5555). If the contractor fails to provide satisfactory and/or adequate fire watchers, the *J.R. Simplot Company* reserves the right to provide the same at the contractor's expense.

e) Painting

No painting shall be started in a new area without obtaining permission of the *Simplot* Project Supervisor.

f) Flammable Liquids

All flammable liquids used by *Contractors* on site shall be stored in safety cans or in factory sealed containers in an area designated by the *Safety Department* and/or Area Supervisor. Containers for bulk storage of flammable liquids must be clearly marked and approved by the *Safety Department*. The *Simplot* Project Supervisor must be notified before these containers are opened.

g) Flammable Materials

*Contractor* shall notify the *Simplot* Project Supervisor immediately if rubbish or flammable materials are stored or accumulated in the area, so as to constitute a fire hazard.

16. PROTECTION OF WORK

a) Barriers

The *Contractor* shall erect and maintain temporary barriers or rails and electric warning lights around ditches, stair and elevator wells and other shafts or openings. Flame-type lighting is NOT to be used.

*Contractors* shall make sure that all personnel under their control area are aware of plant hazard warning signs and barriers and ensure that appropriate restrictions are observed.

b) Scaffolding

The *Contractor* shall furnish all tools, equipment, scaffolding, staging, ladders, flooring, runways and other temporary construction required for the safe execution of this work in the project. All scaffolding, runways and other temporary constructions shall be rigidly built so as to support safely (4) four times the weight of all materials, apparatus, equipment and personnel to be placed thereon or as required by construction regulations. All scaffolding must be erected under the supervision of a *competent* person (as defined under OSHA 1926 sub/paragraph-"L- Scaffolds" 11/29/96).

Fall protection for employees is required as outlined in appropriate OSHA standards.

c) Excavations

The *Contractor* shall furnish all shoring, sheathing, bracing, etc., that excavations may require for the safety of personnel and to comply with regulations. Excavated material shall be placed or piled where designated by plant supervision so as not to block access to process equipment, buildings, roads, fire and safety equipment, etc. A competent person must plan any trench greater than 5' in depth.

d) Roadways, Walkways and Railroad Sidings

All roadways, walkways and railroad sidings must be maintained, in a safe, passable condition by the *Contractor* during the progress of the job.

In the event that a track blockage must occur for the work to be completed, a track blockage permit must be obtained from the *Simplot* Project Supervisor.

e) Tripping Hazards

The *Contractor* must not permit any tripping hazards to be placed in passageways, aisles, stairways, railroad sidings, etc.

f) Loading Structures

The *Contractor* shall not load, nor permit to be loaded, any part of permanent or temporary structures with a weight that will endanger its safety.

g) Entering Confined Spaces

Permits for entering confined spaces (including vessels, bins, duct work, tanks, cooling towers, etc.) are necessary and should be obtained through the designated personnel (normally the *Simplot* Project Supervisor). Each confined space will be inspected immediately prior to entering, all potential hazards identified and then a permit issued to *Contractors* outlining the safety requirements for work to be done. These safety requirements must be complied with before work begins.

*Contractor's* employees may be assigned as safety watches. Certain confined space entries may require one or two safety watch personnel to be on duty at all times that work is in progress.

Certain confined space entries may require rescue kits to be available. Depending on the type of entry this may consist of extrication equipment or may include self contained breathing apparatus (SCBA) equipment. *Contractors* should supply their own rescue kits unless other arrangements are made with the *Simplot* Project Supervisor.

h) Opening Lines or Connected Equipment

The Contractor's workers for each shift and for each location shall obtain permits for opening lines or connected equipment.

In order to protect personnel and property from the physical and chemical hazards that may be associated with the activity, it is necessary that a knowledgeable person (normally the *Simplot* Project Supervisor) outline the steps to be taken to ensure the safe completion of the job on the safety permit. These steps must be complied with before work can begin.

- i) The *Contractor* will use fall protection as required when work is at 6' or greater in height. Personal fall arrest systems must be used under the direction of a *competent* person.

**17. CONTRACTOR'S EQUIPMENT - GENERAL**

All *Contractors'* equipment must be used and stored on site in a safe manner.

a) Ladders, tools, equipment, etc.

Ladders, tools, equipment, etc., used by the *Contractor* must be maintained in a condition that will not constitute a hazard to the *Contractor's* employees or plant personnel.

b) Compressed Gas Cylinders

Compressed gas cylinders in use must be tied securely in an upright position. Cylinders in storage must be securely tied if standing up. Cylinders shall not be hoisted to upper floors of structures or moved from one location to another without the use of a cylinder carrier. Full and empty cylinders must not be left without the safety caps in place.

c) Chains, Ropes and Hoisting Equipment

The *Contractor* shall be responsible to ensure that all chains, ropes and hoisting equipment are safe to use.

d) Cranes and Hoisting Equipment

Cranes may not be put in position, relocated or removed from the plant without prior approval of plant supervision. This is to protect underground and low clearance overhead lines and process equipment. All persons must keep clear from walking or passing under the boom and the loads being transported by a crane or any hoisting device. The operator on board the crane must maintain all annual, monthly, and daily crane inspections.

18. MEDICAL SERVICES:

*Contractors* may be charged a reasonable amount to cover actual costs incurred resulting from their employees being provided medical assistance or transportation to a local hospital. Transportation will be billed at \$125.00 per trip. Charges for medical supplies and/or services of *Simplot's* EMTs or nurse, will be as determined by the Medical Department.

19. REPORTING FIRES, ACCIDENTS OR OTHER EMERGENCIES

- Dial 5555 on any of *J.R. Simplot's* in-plant telephones to report a fire. Give exact location(s), name(s) and condition(s).
- Dial 5555 on any of *J.R. Simplot* in-plant telephones if an ambulance and/or first aid assistance is required.
  - If you are using a cell phone or any other type of non-*Simplot* telephone, Dial 234-5404 (*Simplot Security*) to obtain emergency assistance of any kind.
- All accidents and injuries must be reported to the *J.R. Simplot Company* Safety Department.
- a) In the event of an accident/incident, the *Contractor* is required to complete an incident investigation as soon as possible, or prior to completion of the work shift. The *Simplot* Project supervisor and Safety Department must be notified of the location and the time the investigation will take place. A *written* investigation form must be completed. The *Contractor* may use their own form or the *Simplot* form; however, the report will provide the following information, at a minimum:
  1. The stated accident/incident and all the information pertinent to it.
  2. The root cause(s) of the accident/incident
  3. Information on what corrective actions the *Contractor* will take to ensure that the accident/incident will not occur again.

20. TRACK BLOCKAGE

To ensure the safety of all individuals working on or near the railroad tracks, all *Contractors* and *Simplot* Maintenance personnel are required to obtain a track blockage permit and are responsible for removing LockOut equipment and notifying the Switch Crew when work is completed.

21. ISSUING PARTS TO CONTRACTORS

We will issue water to *Contractors* using the employee number of the *Simplot* Project Supervisor.

No repair parts, operating supplies or PPE (Personal Protective Equipment) will be issued to *Contractors*. The only 2 exceptions are: (1) *Simplot* will provide LockOut/TagOut safety locks, and (2) if there is *written* authorization by a member of *Simplot's* PMT (Plant Management Team). Types of PPE that *will not be issued* include, but are not limited to:

hard hats, safety glasses, side shields, safety boots, rubber gear, respirators, fall protection, gloves, etc.

**22. TRANSPORTING PERSONNEL IN OPEN TRUCK BEDS**

Please be advised that all pickup trucks used to transport personnel must be equipped with a railing along each side. All personnel must be seated and legs may not extend over the tailgate. The driver must be especially alert to other traffic, stop signs and rail crossings. A **maximum speed limit of 15 mph must be strictly observed.**

For further information, *Contractors* should refer to 29 CFR part 1910 "Occupant Protection in Motor Vehicles" relative to transporting personnel in open bed trucks.

**23. MOBILE EQUIPMENT REQUIRING BACKUP ALARMS**

All "working equipment" vehicles that operate on site must have a backup alarm. This policy applies to equipment owned or rented by *Contractors*.

"Working Equipment" vehicles are defined as those that perform a function that occupies the attention of the operator, such that full attention is not given to reverse motion such as loads, levels, dumps, lifts, etc. A backup alarm is also required when the operator's view is obstructed in the reverse direction.

Typical equipment that would require a backup alarm includes, but is not limited to:

- Loaders, dozers, cranes, forklifts, manlifts, large trucks, graders, backhoes.
- It is not intended that cars or pickup trucks will need a backup alarm.

## **Contractor Environmental Awareness**

### **I. Introduction:**

The Resource Conservation & Recovery Act (RCRA), is the primary law that regulates how waste materials are handled. RCRA places a special emphasis on hazardous wastes - the wastes that can harm human health and/or the environment. RCRA mandates that "**ALL WASTES MUST BE CHARACTERIZED**" in accordance with the law prior to throwing them away. The law further identifies this responsibility belonging to the person(s) generating the waste - **YOU!**

To know if you have a regulated waste you must determine if the material:

1. is a solid, liquid, or contained gas; and
2. is being discarded or abandoned because it has served its intended purpose and you can no longer use it; or
3. is excluded from regulation.

At the Don Plant the only wastes excluded from RCRA regulation are the phosphogypsum wastes and process sluice water going up on the hill.

- As the generator of waste materials, you are required to properly dispose of all hazardous and non-hazardous wastes in accordance with all State and Federal Regulations. Your contract states that you agree to properly dispose of any generated wastes in coordination with and through the *J.R. Simplot* Environmental Department.
- Cleanup by the *J.R. Simplot Company* of any *Contractor* spills or unauthorized waste disposal will be charged to the *Contractor* at triple the cost.

### **II. What's a hazardous Waste?**

RCRA identifies a hazardous waste as:

- a waste material which contains chemical constituents listed on any of EPA's "F", "K", "P", or "U" lists; and/or
- any waste which exhibits any of four following characteristics:
  - a) **ignitability** - flash point  $< 140^{\circ}$  F, spontaneous combustion, fire by friction;
  - b) **corrosivity** - liquid with pH,  $\leq 2$ , OR  $\geq 12.5$ , that corrodes steel;
  - c) **reactivity** - unstable, reacts violently with water, explosive;
  - d) **toxicity** - "D" listed material (any of 40 constituents - e.g. lead, mercury, benzene).

Aerosol cans, batteries, light bulbs, solvents and solvent rags are some of the typical wastes identified at the Don Plant as being regulated hazardous wastes. Remember, if you generate a waste, you must determine if it is hazardous and then manage it properly.

### III. Waste Management Practices at the Don Plant for Contractors

- 1) *Contractors* must specify any non-hazardous materials that will be disposed of in our plant tip-bins or BFI roll-off bins, prior to the commencement of work.
- 2) *Contractors* must properly label **ALL** waste receptacles. Labels are available at the Stores Issue Counter. Contact your *Simplot* point-of-contact or Environmental Support for help with labeling requirements.
- 3) *Contractors* are required to practice good housekeeping.
- 4) *Contractors* are expected to remove excess materials brought into the Don Plant at the conclusion of the job/contract.
- 5) *Contractors* are expected to use non-hazardous substitutions whenever possible for any materials brought on-site.
- 6) *Contractors* must identify any *RCRA* hazardous wastes that will be generated and disposed of on-site, as stated in their contract, prior to the commencement of work. Hazardous waste should be accumulated in the **Contractor Satellite Accumulation Area (SAA)**, or taken to the **Area SAA** where the project is taking place. All hazardous waste must: 1) be placed in a container with a secure lid; 2) the container must be labeled; and 3) the material must be logged into the "Daily Accumulation Control Log".
- 7) *Contractors* using the on-site "Construction/Demolition Landfill" must comply with all permit conditions, including waste identification and volume. All quantities of hazardous, PCB, general sanitary garbage, and liquid waste are prohibited from the Construction/Demolition Landfill. Only clean, inert construction debris is allowed - **NO EXCEPTIONS!!**
- 8) *Contractors* are prohibited from dumping any hazardous substance or oil on any soil. *Contractors* are also prohibited from dumping any material down any drain without prior approval.
- 9) *Contractors* are prohibited from disturbing any asbestos containing material unless they have been properly trained, and are authorized to do asbestos work.
- 10) If there is a fire, explosion, or release of hazardous waste which could threaten human health and/or the environment, the Don Plant Emergency Response Plan must be immediately implemented.
  - If you witness or are involved in such an emergency, notify the Don Plant Security by dialing 5555. Stay on the line until they ask for all of the necessary information.

FOR REFERENCE ONLY

# Exhibit C - Chemical Inventory/MSDS Information

Company Name: \_\_\_\_\_ Date: \_\_\_\_\_ -2001 Page \_\_\_\_\_ of \_\_\_\_\_

**Instructions:** Using your MSDS, list the product name and the hazardous ingredient(s) for each material that will be brought to J.R. Simplot Company's (Don Plant) site. Then complete the comments section with miscellaneous information such as: recommended safety equipment, storage location, date brought on site, disposal method, and etc. This information is also required for any sub-contractors working for you on J.R. Simplot Company's site. Please keep a copy of this list for your records.

Product & Ingredient %	C.A.S. #	PEL/TLV	F.P.	pH	Reactive	Quantity on Site (size)	Comments: PPE/ Location Stored/ Date In/ Disposal Method/ Etc.
_____							
_____							
_____							
_____							
_____							
_____							
_____							

# Exhibit C - Chemical Inventory/MSDS Information

Company Name: Contractor XX YY ZZZZZ - Any Town, USA

Date: 7-10-2001 Page 1 of 1

**Instructions:** Using your MSDS, list the product name and the hazardous ingredient(s) for each material that will be brought onto *J.R. Simplot Company's* (Don Plant) site. Then complete the comments section with miscellaneous information such as: recommended safety equipment, storage location, date brought on site, disposal method, and etc. This information is also required for any sub-contractors working for you on J.R. Simplot Company's site. Please keep a copy of this list for your records.

Product - Ingredient %	C.A.S. #	PEL/TLV	F.P.	pH	Reactive	Quantity on Site (size)	Comments: PPE/ Location Stored/ Date In/ Disposal Method/ Etc.
<div> <div>Example</div> <div>blank copy on following page</div> </div> <div> <p><b>NOTE: You <i>MUST</i> present Exhibit "C" to Simplot Project Manager <i>BEFORE</i> work begins!!</b></p> </div>							
Form Oil							
- Naphthenic Oil 90 %	64741-43-1	N/A	280° F	7	Stable	1 each (5 gal. can)	Non-hazardous. Store in cabinet #2.
-Tall Oil Fatty Acid 5 %	61790-12-3	N/A					Recycle used oil. 7-3-97
Phosphoric Acid 93%	7664-38-2	1 mg/M3	N/A	<1	Stable	3 each (55 gal. Drums)	Wear rubber gear/gloves.  Located outside under awning. Recycle into Phos Acid Plant. 7-9-97
Plasite #20 Thinner 80%							
-Methyl Ethyl Ketone	78-93-3	590 mg/M3	24° F	N/A	Stable	1 each (gal. Bottle)	Wear solvent resistant gloves/goggles. Stored in flammable cabinet. 7-10-97



AgriBusiness  
J.R. Simplot Company, Don Plant  
P.O. Box 912 Pocatello, ID 83204  
1150 West Highway 30, Pocatello, ID 83201  
Cheri Parker – 208-234-5486

FOR REFERENCE ONLY

Dear Contractor,

The following documents are some of Simplot's basic policies of which you need to be aware. **This information is not all inclusive.**

- ❖ Substance Abuse Policy - Letter
- ❖ Facial Hair Policy
- ❖ Stop Work Authority
- ❖ Approved and Disapproved Sandblasting Grits
- ❖ Contractor Weekly Area Audit - Form
- ❖ Health and Safety Plan (HASP) - Form
- ❖ Welding Respirator Policy – Letter
- ❖ Evaluation of Breathing Air Systems
- ❖ Respirator Selection for Welding
- ❖ Don Plant People and Phone Numbers
- ❖ Kode of the KOA

When you go through your company's indoctrination with the Safety Department, your specific job(s) will be reviewed and additional policies may apply.

Sincerely,

Cheri Parker



AgriBusiness  
J.R. Simplot Company, Don Plant  
P.O. Box 912 Pocatello, ID 83204  
208-234-5366 Fax 208-234-5493

December 2000

FOR REFERENCE ONLY

Dear Contractor,

The Don Plant has adopted a Substance Abuse policy that became effective on January 1, 1998.

The J.R. Simplot Company is concerned for the safety and health of our workers and contractor's employees who work in our facility. Our goal is to provide a safe work environment for *all* people. As contractors, your employees and sub-contractors working for you on our site are part of the J.R. Simplot Company's work environment.

To ensure the safety of *all* workers within our environment, we are requiring *all* contractors to implement a Drug and Alcohol testing program which meets or exceeds the requirements of the J.R. Simplot Company's Substance Abuse Policy. Each contractor who conducts work or provides services at J.R. Simplot Company's facility must have implemented a full program.

To assist you in understanding the Simplot Substance Abuse Policy, the following is an overview of our testing procedures and requirements:

- Pre-Employment-100% of new hires must be tested for 5 panels of drugs plus alcohol.
- Random Testing-The workforce must be tested at the rate of at least 20% per year for 5 panels of drugs plus alcohol.
- Post Accident
- Reasonable Suspicion

The 5 panels of drugs to be tested by a NIDA certified lab include:

- Marijuana, Cocaine, Opiates, PCP, and Amphetamines.
- Alcohol Levels: any level of .06% or greater violates the J.R. Simplot Company's Substance Abuse Policy.

In order to be in compliance, any employee of a contractor (including sub-contractors) will not be allowed back on J.R. Simplot Company's property for one (1) year if he/she violates any of the following:

- a. Refusing to submit to a drug and or alcohol test.
- b. Altering, tampering, diluting or switching his/her sample to be used for drug or alcohol testing.
- c. Using, manufacturing, distributing, dispensing, selling or possessing any illegal drugs on company property.
- d. Testing positive for Illegal Drugs and/or Alcohol at the .06% level or greater.

J.R. Simplot Co. will grandfather existing contractor's employees for pre-employment screening only. Drug and alcohol testing requires the utmost confidentiality. The J.R. Simplot Company will not ask you to share any personal information as it applies to drug test results. However, the J. R. Simplot Company reserves the right to randomly audit your program to ensure compliance with our Substance Abuse Policy.

If you need any information on third party administrators to assist you in implementing a testing program, the Safety Department will assist you in identifying resources.

Your cooperation in this effort to improve the safety of *all* who work within our environment is appreciated. If you have any questions you may contact me at 208-234-5366.

Sincerely,

Bill Wall, *Safety Services Manager*

# J.R. Simplot Company, Don Plant

## Facial Hair Policy

(Last Revision 1-30-97)

FOR REFERENCE ONLY

All individuals (including Contractors and Consultants) **MUST BE** clean shaven if they will be entering or working in areas where there is an exposure, or a potential exposure to an inhalation hazard.

Under this policy, customers, salespersons or vendors that will be conducting business in offices, changerooms, or riding in vehicles are NOT required to be clean shaven. If escorted by a Simplot employee, these individuals may enter the process areas of the plant for short duration visits (no more than four (4) hours) and will NOT be required to meet the clean shaven policy.

Any individual who works in the following designated *non-respiratory* areas will not be required to be clean shaven. **All other plant locations, NOT listed below, will REQUIRE the individual to be clean shaven.** Any Simplot worker, Contractor, or paid Consultant leaving these areas to enter any other part of the plant, **MUST** be clean shaven.

### Designated NON-Respiratory Areas

Machine Shop Area	Production Lunch Room	Ambulance/Office Bldg.
Central Equip./Tech	Maintenance Lunch Room	Mobile Equipment Shop
Main Building	Guard House	* Pump Repair Shop
Stores Main Bldg.	Maintenance Offices	* Weld Shop
Gyp Stack	Environmental	
Salvage Reclaim	Safety/Medical	

This area will have monitoring conducted to characterize the exposure of the worker and may be taken off the list in the future.

## Clean Shaven

**Individuals required to be clean shaven shall adhere to the following guidelines:**

1. Personnel shall be required to be clean shaven in the respirator seal area.
  - a) Anywhere the respirator contacts the skin,
  - b) sideburns **may not** extend into the seal area,
  - c) mustaches **shall not** extend into the seal area nor interfere with the respirator operation, and
  - d) **NO beards are allowed!**

(NOTE: See following page for pictorial examples of ACCEPTABLE and UN-ACCEPTABLE facial hair styles)

2. All employees shall shave prior to the start of the shift to be considered clean shaven — **NO STUBBLE.**
3. This policy applies at all times including "Call-Outs".

The shaded portions are your respirator seal areas.  
Facial hair is NOT permitted on these portions of the face:



## UN-ACCEPTABLE



Full Beard



Goates & Narrow Mustache



Goates & Wide Mustache



Extended Side Burns



Fu Manchu Mustache



Wide Mustache

## ACCEPTABLE



Clean Shaven



Narrow Mustache



AgriBusiness J.R. Simplot Company, Don Plant  
P.O. Box 912 Pocatello, ID 83204

EDM REFERENCE ONLY

## Stop Work Authority

Approved by Plant Leadership Team January 1999

Everyone who works in the Don Plant facility has the right and obligation to feel safe doing their job. *No one will be required to perform services that endanger their physical safety.* Anyone has the right to stop a job if his or her safety or the safety of his or her co-workers is in question. If you see unsafe acts, conditions, or behaviors, you not only have the right but the obligation to stop the job until the problem(s) can be resolved. *Refusal to work in an unsafe situation will not constitute grounds for discharge or discipline.*

Everyone also has the responsibility to find a safe way to complete his or her job. If you cannot figure it out by yourself or with your crew, work through the area supervision to resolve the safety concern(s). If the issue(s) cannot be resolved at this level, contact a member to the Safety Committee, Safety Department, or the Plant Management Team (PMT) and they will get the appropriate people together to help solve the problem(s).

---

Del Butler  
Don Plant Manager



AgriBusiness  
J.R. Simplot Company, Don Plant  
P.O. Box 912 Pocatello, ID 83204  
208-234-5366 Fax 208-234-5493

FOR REFERENCE ONLY

## Don Plant Approved and Disapproved Sandblasting Grits

(Revised 10-8-96)

Industrial Hygiene and Environmental have reviewed and approved the following list of abrasive blasting agents for use in the Don Plant. Each agent was reviewed for worker safety and waste disposal.

1. Kleen Blase
2. Ruby Garnet
3. Green Diamond (1636 type ONLY)
4. Sunstone

No other blasting agents shall be used unless reviewed and approved.

The following blasting agents have been reviewed and have been considered NOT to meet the Health and Safety Standards or Waste Disposal requirements for the Don Plant.

1. Green Diamond - 1650 and 2050
2. Black Hawk
3. Nevada Black
4. Unimim



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J.R. Simplot Company, Don Plant  
P.O. Box 912  
Pocatello, ID 83204

FOR REFERENCE ONLY

## CONTRACTOR WEEKLY AREA AUDIT

Contractor Name: \_\_\_\_\_ Date: \_\_\_\_\_

Contractor Supervisor: \_\_\_\_\_ Area Inspected: \_\_\_\_\_

ITEM DEFICIENCY	CORRECTIVE ACTION/DATE COMPLETED

Signature of person completing form: \_\_\_\_\_



## WEEKLY AREA AUDIT -- Inspection Items to Look For

### SAFETY

- ☐ Are barricades signed, dated and readable?
- ☐ Are work sites clean, sanitary and orderly?
- ☐ Are work sites kept dry to prevent a slip or fall?
- ☐ Is all regulated waste or hazardous waste discarded properly?
- ☐ Are all exits in the work area kept free of obstructions?
- ☐ Are floor openings and pits guarded by a cover?
- ☐ Are restrooms and lunchrooms clean and sanitary?

### ELECTRICAL

- ☐ Portable electrical tools grounded/double insulated?
- ☐ Extension cords free of frays, splices or tapes?
- ☐ Are ground fault circuit interrupters installed?
- ☐ Are all openings closed on electrical enclosures?

### HARD COMMUNICATION & CHEMICALS

- ☐ Are MSDS's available on site for all chemicals?
- ☐ Are safety shower/eye wash stations operable?
- ☐ Are all containers labeled properly?

### PERSONAL PROTECTIVE EQUIPMENT

- ☐ Are employees using PPE?
- ☐ Is PPE stored and maintained properly?
- ☐ Are respirators stored and maintained properly?
- ☐ Are ear protection devices used in noisy areas?

### LOCK-OUT / TAG-OUT

- ☐ Do employees keep the keys to personal safety locks?
- ☐ Have all energy sources been identified and isolated?

### FIRE EQUIPMENT AND WELDING

- ☐ Are fire extinguishers inspected monthly?
- ☐ Are fire extinguishers provided in adequate numbers?
- ☐ Are gas cylinders marked clearly?

- ☐ Are cylinders stored and transported to prevent tipping, falling or rolling?
- ☐ Are valve protectors installed on cylinders not in use?
- ☐ Have all combustible materials been removed from welding areas?
- ☐ Are approved containers used for flammable and combustible liquids?
- ☐ Are leads free of wear and damage? Adequate insulation?

### CONFINED SPACES

- ☐ Are atmospheric tests conducted before entry?
- ☐ Is an attendant stationed outside the confined space?
- ☐ Is retrieval equipment available for rescue?

### CRANES and HOISTS

- ☐ Are cranes inspected for defects prior to any shift?
- ☐ Is the rated capacity visibly marked on each crane?
- ☐ Does the crane have a current certification for capacity?
- ☐ Are workers prevented from walking under suspended loads?

### LADDERS

- ☐ Do ladders extend 3 feet above the elevated platforms and roofs?
- ☐ Are ladders inspected for damage prior to use?

### MACHINE GUARDING

- ☐ Is equipment kept clean and properly maintained?
- ☐ Are machinery guards secure and properly maintained?
- ☐ Are saws equipped with anti-kick back devices?



AgriBusiness  
J.R. Simplot Company, Don Plant  
P.O. Box 912 Pocatello, ID 83204  
208-234-5366 Fax 208-234-5493

December 2000

FOR REFERENCE ONLY

Dear Contractor,

Re: Welding Respirator Requirements

The Don Plant adopted a welding respirator policy that became effective on December 9, 1997.

This policy applies to all individuals welding at the Don Plant. As a contractor, your employees and sub-contractors working for you on our site must comply with this policy. Copies of "Respirator Selection" and "Evaluation of Breathing Air Systems" check list are attached for your convenience.

Exposure to welding fumes and vapors has been studied in industry for a number of years. This policy was developed over the last year by using monitoring data that was collected at the Don Plant and from other industry data respirator guidelines, from sources such as the American Welding Association. There are various heavy metals and toxic gasses given off during welding processes. Some of the elements of concern are Chromium, Chromium VI, Nickel, CO (Carbon Monoxide), and NO<sub>x</sub>.

When an individual is exposed to heavy metals, such as Chromium VI, it tends to build up in the body in appreciable quantities. The collection of these elements in the body may become toxic to an individual and affect how the body functions. This new policy was developed to help ensure that our employees, contractor's employees and their sub-contractors are not being over-exposed to welding contaminants and to ensure everyone's continued good health.

If you have any questions concerning this policy, you may contact me at 208-234-5366.

Sincerely,

Bill Wall, *Safety Services Manager*

# RESPIRATOR SELECTION

## for Welding at J.R. Simplot Company, Don Plant

WELDING PROCESS	SHOP WELDING	FIELD WELDING <i>Good Ventilation</i>	FIELD WELDING <i>Confined Areas</i>	FIELD WELDING <i>Confined Spaces</i>
Shield Metal Arc Welding (carbon steel)	Not required, except for galvanized, HEPA	Not required, except for galvanized, HEPA	HEPA required	Supplied air required <sup>5</sup>
Shield Metal Arc Welding (alloys)	HEPA required <sup>1</sup>	HEPA required <sup>1</sup>	HEPA required	Supplied air required <sup>5</sup>
Arc Cutting or Gouging (cut rod/throat)	HEPA required <sup>2</sup> must have ventilation	HEPA required	Supplied air required	Supplied air required
Oxy-Acetylene Torch Cutting	Not required unless galvanized, HEPA	Not required unless galvanized, HEPA	Not required unless galvanized, HEPA	Supplied air required <sup>5</sup>
Plasma Arc Cutting	HEPA required <sup>3</sup> , supplied air recommended	HEPA required, supplied air recommended	Supplied air required	Supplied air required
Gas Metal Arc Welding (MIG)	Not required <sup>4</sup>	Not required	Supplied air required	Supplied air required <sup>5</sup>
Gas Tungsten Arc Welding (TIG)	Not required	Not required	Not required	Supplied air required <sup>5</sup>

- 1 Commercially approved local exhaust ventilation systems may be used to help control some personal exposure to welding fumes if the exhaust inlet is located less than 12". (Preferably 4-6".) from the source of the welding fume. This assumes that the ventilation system is working as designed by the manufacturer, filters are cleaned regularly, the exhaust inlet is located directly over the generation site, and the worker is positioned so that the fumes are pulled away from the worker.
- 2 This process is very dirty and should be conducted outside when possible unless an adequate building ventilation system (as determined by the Safety Department) is installed for a shop area. In the winter, it is recommended to use air movers and open doors to the area.
- 3 Unless an adequate building ventilation system (as determined by the Safety Department) is installed for a shop area it is recommended to use air movers and open doors to the area (during the winter).
- 4 Exposure to Chrome VI, a known carcinogen, is of concern during this welding process. Chrome VI and Chromium are often found in the air in large quantities when conducting work with stainless materials. Local exhaust ventilation is highly recommended for this type of welding on stainless materials.
- 5 Supplied air respiratory equipment is not required if each welder has an adequate ventilation exhaust blower (minimum 700 cfm). "Point source ventilation" must not be more than 12 inches from the welding source.

### CAUTION

If welding on surfaces containing materials such as Phos Acid, Sulfuric Acid, Sulfur, etc., there may be HAZARDOUS fumes or vapors given off and therefore adequate respiratory protection may be required.

Use common sense when welding or cutting with materials containing manganese. Historically, manganese is present, sometimes in very appreciable quantities when exposure monitoring is conducted.



# HEALTH AND SAFETY PLAN (HASP)

## PROJECT INFORMATION

FOR REFERENCE ONLY

Project Name/Description: \_\_\_\_\_

Proposed Start-Up Date: \_\_\_\_\_

Proposed Completion Date: \_\_\_\_\_

General Contractor: \_\_\_\_\_

Sub-Contractors: \_\_\_\_\_

## PROJECT PERSONNEL

CONSTRUCTION	SIMPLLOT
Superintendent:	Project Manager:
Supervisor/Foreman: (If different than the Superintendent)	Field Supervisor: (If different than the Project Manager)
Safety Representative: (If applicable)	Safety Representative: (If applicable)

## REVIEWS and APPROVALS

### Construction Contractor Superintendent/Supervisor

Printed Name: \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

### Simplot Project Manager

Printed Name: \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

### Simplot Safety

(If Applicable)

Printed Name: \_\_\_\_\_

### Construction Safety

(If Applicable)

Printed Name: \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

Distribution: Original completed and approved in project file. Copies given to all personnel listed on the form.



Give a brief description of the general overall project:

List each phase/task of construction and the safety hazards associated with it. Describe how each hazard will be controlled.

Attach additional sheets as necessary.



# HEALTH AND SAFETY PLAN (HASP)

FOR REFERENCE ONLY

The intent of this document is to provide information to all parties on the scope of work and what safety hazards may be encountered during a contractor project. The hazards identified will be controlled in some form. Try to identify where the hazards are before personnel are exposed and how to prevent injury to all personnel.

The project manager is responsible to ensure that a HASP is completed prior to the start of a project. A HASP will be completed for all projects conducted at the Simplot Don Plant.

## HASP INSTRUCTIONS

Project Information	Complete all information.
Project Personnel	Complete as required.
Reviews and Approvals	Complete as required.
Project Description	Give enough information to give a general understanding of what will occur during the project.
Project Safety	List each phase of construction and the associated hazards that may be encountered during each phase. If a particular hazard may be present during all phases you may start that chart with a "General Project" block and list the hazards. Address each hazard with a specific control measure that will be used to control it. This may include Engineering Controls such as guards or barricades. There are PPE (Personal Protective Equipment) requirements that may need to be used.

### Examples of Safety and Health Hazards.

This list is NOT all-inclusive.

Fall Hazards	Chemical Exposures	Heavy Equipment	Fire/Explosion
Confined Space Entry	Sulfuric Acid	Trenching/Shoring	Cutting & Welding
Respiratory/Inhalation	Phos Acid	Unstable/Uneven Terrain	Overhead Hazards
Dust	Nitric Acid	Slips/Trips/Falls	Vehicular Traffic
Heat Stress	Sulfur Dioxide (SO <sub>2</sub> )	Engulfment	Rail/Train Traffic
Cold Stress	Carbon Monoxide (CO)	Oxygen Depletion	
Electrical	Nitrogen Oxides (NO <sub>x</sub> )	Oxygen Enrichment	
	Cadmium (Cd)		
	Hydrogen Fluoride (HF)		
	Hydrogen Sulfide (H <sub>2</sub> S)		

### Examples of Construction Phases/Tasks.

This list is NOT all-inclusive.

Demolition	Scaffold Erection
Structural Steel Erection	Masonry
Excavation	Confined Space Entry Operations
Pipe Fitting	Roofing
Electrical Wiring	Elevated Work Above 6 Feet
Painting	Concrete Pouring
Welding Operations	Concrete Form Installation
Crane Operations	



# HEALTH AND SAFETY PLAN (HASP)

## PROJECT INFORMATION

Project Name/Description: \_\_\_\_\_

Proposed Start-Up Date: \_\_\_\_\_

Proposed Completion Date: \_\_\_\_\_

General Contractor: \_\_\_\_\_

Sub-Contractors: \_\_\_\_\_

## PROJECT PERSONNEL

CONSTRUCTION	SIMPLOT
Superintendent:	Project Manager:
Supervisor/Foreman: (If different than the Superintendent)	Field Supervisor: (If different than the Project Manager)
Safety Representative: (If applicable)	Safety Representative: (If applicable)

## REVIEWS and APPROVALS

### Construction Contractor Superintendent/Supervisor

Printed Name: \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

### Simplot Project Manager

Printed Name: \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

### Simplot Safety

(If Applicable)

Printed Name: \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

### Construction Safety

(If Applicable)

Printed Name: \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

Distribution: Original completed and approved in project file. Copies given to all personnel listed on the form.



# HEALTH AND SAFETY PLAN (HASP)

## PROJECT DESCRIPTION

Give a brief description of the general overall project:

FOR REFERENCE ONLY

## PROJECT SAFETY

List each phase/task of construction and the safety hazards associated with it. Describe how each hazard will be controlled.

Construction Phase/Task	Safety and Health Hazards	Safety Precautions Taken

Attach additional sheets as necessary.



## HEALTH AND SAFETY PLAN (HASP)

The intent of this document is to provide information to all parties on the scope of work and what safety hazards may be encountered during a contractor project. The hazards identified will be controlled in some form. Try to identify where the hazards are before personnel are exposed and how to prevent injury to all personnel.

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### HASP INSTRUCTIONS

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Project Personnel	Complete as required.
Reviews and Approvals	Complete as required.
Project Description	Give enough information to give a general understanding of what will occur during the project.
Project Safety	List each phase of construction and the associated hazards that may be encountered during each phase. If a particular hazard may be present during all phases you may start that chart with a "General Project" block and list the hazards. Address each hazard with a specific control measure that will be used to control it. This may include Engineering Controls such as guards or barricades. There are PPE (Personal Protective Equipment) requirements that may need to be used.

### Examples of Safety and Health Hazards.

This list is NOT all-inclusive.

Fall Hazards	Chemical Exposures	Heavy Equipment	Fire/Explosion
Confined Space Entry	Sulfuric Acid	Trenching/Shoring	Cutting & Welding
Respiratory/Inhalation	Phos Acid	Unstable/Uneven Terrain	Overhead Hazards
Dust	Nitric Acid	Slips/Trips/Falls	Vehicular Traffic
Heat Stress	Sulfur Dioxide (SO <sub>2</sub> )	Engulfment	Rail/Train Traffic
Cold Stress	Carbon Monoxide (CO)	Oxygen Depletion	
Electrical	Nitrogen Oxides (NO <sub>x</sub> )	Oxygen Enrichment	
	Cadmium (Cd)		
	Hydrogen Fluoride (HF)		
	Hydrogen Sulfide (H <sub>2</sub> S)		

### Examples of Construction Phases/Tasks.

This list is NOT all-inclusive.

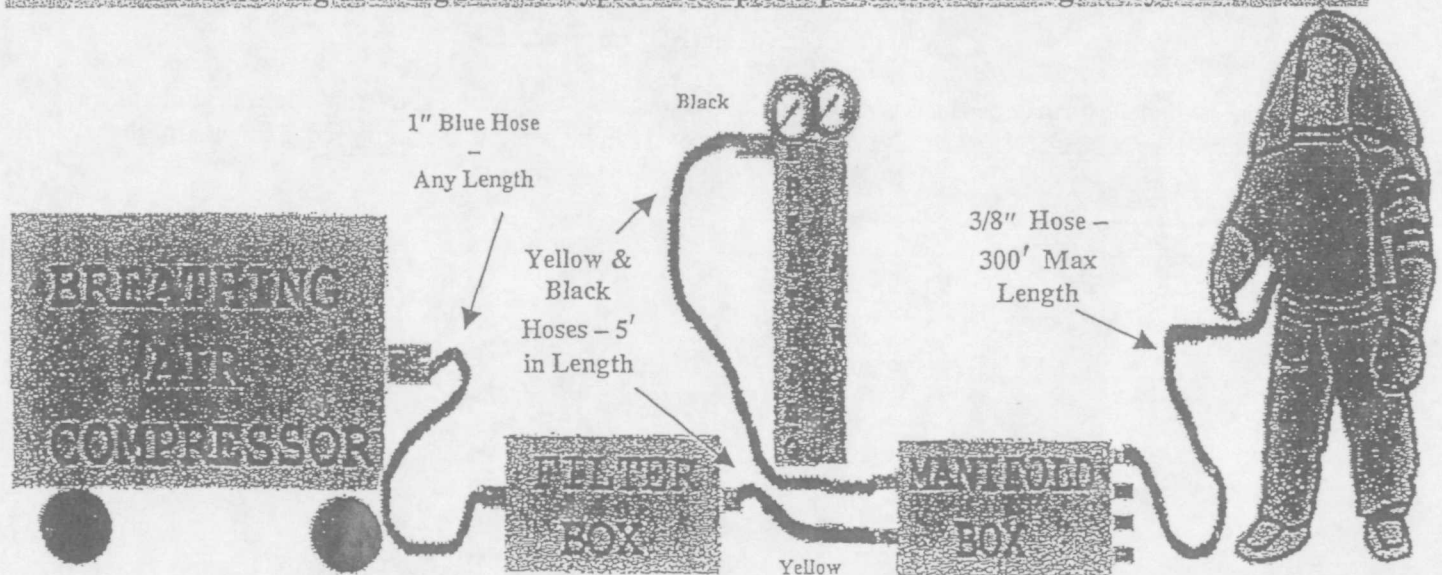
Demolition	Scaffold Erection
Structural Steel Erection	Masonry
Excavation	Confined Space Entry Operations
Pipe Fitting	Roofing
Electrical Wiring	Elevated Work Above 6 Feet
Painting	Concrete Pouring
Welding Operations	Concrete Form Installation
Crane Operations	

# Evaluation of Breathing-Air Systems **FOR REFERENCE ONLY**

Prior to using a breathing air compressor and airline respirators, use the following checklist to ensure the system is properly set up and safe for use:

1. ☐ Ensure the compressor is located such that contaminated air from chemicals, vehicle exhaust, or other atmospheric hazards are not introduced into the breathing air system.
2. ☐ Verify the compressor has had a "Breathing Air" test in the last six months to ensure the air meets Grade "D" breathing air standards.  
(A sticker is affixed to the compressor showing last test date and test due date.)
3. ☐ Verify the carbon monoxide monitor calibration is current. (See calibration sticker on monitor.)
4. ☐ Ensure carbon monoxide monitor is plugged in (110 volt) if using a portable manifold unit.
5. ☐ Ensure carbon monoxide monitor is working properly by checking monitor indicator.
6. ☐ Ensure bottled air cylinders are fully charged.
7. ☐ Ensure bottled air cylinders are filled with Grade "D" breathing air (See label on cylinder).
8. ☐ Ensure air purification unit is current on its preventive maintenance schedule (See sticker).
9. ☐ Ensure the large 1" breathing airline hose is clean and has never been used for anything other than breathing air.  
NOTE: Only use the 1" Blue "Goodyear" brand hose from the compressor to the breathing air manifolds.
10. ☐ Ensure that the small diameter 3/8" hose from breathing air manifold(s) to the respirator(s) is the same brand as the respirator:  
North - 3/8" Blue color hose  
MSA - 3/8" Black color hose  
3M - 3/8" Yellow color hose
11. ☐ Purge the entire breathing air system to take out any contaminants before using.

The following drawing shows a typical set up of a portable breathing air system:



### Definitions:

- **Confined Area** - A work area where the welder cannot move his/her head out of the welding fumes 100% of the time.
- **Good Ventilation** - A work area where natural or engineered ventilation keeps the welder's head out of the welding fumes 100% of the time.
- **Adjacent Workers**- If other workers in the area cannot stay out of the welding fumes 100% of the time, they would be required to wear PPE (personal protective equipment) to prevent exposure. In a confined space, all workers would require the same PPE as the welder.

### Rationale:

Shielded Metal Arc Welding (carbon) -	Supplied air in the confined spaces would be justified by the sheer amount of fumes that can be produced.
Shielded Metal Arc Welding (alloys) -	Depending upon the type of alloy utilized, Chrome and Chrome VI can be produced in large quantities. Both of these materials have low TLVs.
Air Arcing (cut rod/throat) -	Carbon Monoxide, in addition to fumes can be produced. This is a dirty process but sampling for this in the shop has not yielded over-exposures for short duration jobs.
Oxy/Acetylene -	Carbon Monoxide is produced in many cases.
Plasma Arc Cutting -	NO <sub>x</sub> , Ozone and other materials are produced, as well as fumes.
Gas Metal Arc Welding (MIG) -	This process produces Carbon Monoxide, as well as large quantities of fume. If ventilation is poor, a HEPA should be utilized.
Gas Tungsten Arc Welding (TIG) -	The sampling that has been conducted justifies the "not required" list for all types of welding, except confined spaces. However, fumes as well as Carbon Dioxide and NO <sub>x</sub> are produced.

Industrial hygiene tests may be run for long-duration job tasks. If the results show that controls are in place to prevent exposure, a NEA (Negative Exposure Assessment) can be written to modify requirements for that specific job.



## Maintenance Department - Phone Numbers

FOR REFERENCE ONLY

10	<b>Darrell Lish</b> (C) Steve Landon (R) Robert Ganske	208-234-5442 208-234-5316	<ul style="list-style-type: none"><li>• Machine Shop</li><li>• Heat Exchanger Repair</li></ul>
15	<b>Darrell Lish</b> (C) Dave Jensen (R) Robert Ganske	208-234-5442 208-234-5316	<ul style="list-style-type: none"><li>• Mobile Equipment/Cranes</li><li>• Building Maintenance</li><li>• Tool Repair</li></ul>
30	<b>Everett Frasure</b> (C) Jim Neal (C) Earl Williams (R) Tom Palmer	208-234-5441 208-234-5543	<ul style="list-style-type: none"><li>• Phos Acid-P205</li><li>• Digesters</li><li>• Filters</li><li>• Evaporators</li><li>• Tank Farm</li><li>• Gyp Handling</li><li>• Water Reclaim</li><li>• Slurry Receiving</li></ul>
35	<b>Paul Taylor</b> (C) Frank Rowberry (R) Tom Palmer	208-234-5448	<ul style="list-style-type: none"><li>• Sulfuric Plants</li><li>• Boilers</li><li>• Ammonia Plants</li><li>• Solutions</li><li>• Effluent Treatment</li><li>• Nitric Acid</li></ul>
40	<b>Dennis Moffit</b> (C) Sheldon Olsen (R) Tom Palmer	208-234-5436 208-234-5416	<ul style="list-style-type: none"><li>• Granulation #1</li><li>• Granulation #2</li><li>• Granulation #3</li><li>• Sulfate</li><li>• Bulking</li></ul>
50	<b>Klay Wagner</b> (R) Dave Beard	208-234-5407	<ul style="list-style-type: none"><li>• Salvage and Reclaim</li></ul>
60	<b>Richard McFadden</b> (C) Gary Ray (R) Tony Aguilar	208-234-5359	<ul style="list-style-type: none"><li>• Projects/Carpenters</li></ul>
70	<b>Dan Smith</b>	208-234-5455	<ul style="list-style-type: none"><li>• Engineering Projects</li></ul>
80	<b>Pete Sengbusch</b> (C) Barry Freund (R) Dave Wilker	208-234-5445	<ul style="list-style-type: none"><li>• Electrical</li></ul>
85	<b>Gary Byington</b> (C) Richard Honstetter (R) Steve Crane	208-234-5451	<ul style="list-style-type: none"><li>• Instrumentation</li></ul>
90	<b>Richard McFadden</b> (C) Gary Ray (R) Tony Aguilar	208-234-5359	<ul style="list-style-type: none"><li>• Energy Conservation (Insulators)</li></ul>
91	<b>Evan Smith</b> (C) Pete Morey (R) Tom Palmer	208-234-5421	<ul style="list-style-type: none"><li>• Vibration Analysis</li><li>• Oilers</li></ul>
93	<b>Richard McFadden</b> (C) Gary Ray (R) Tony Aguilar	208-234-5359	<ul style="list-style-type: none"><li>• Painters</li></ul>

(C) = Crew Coordinator

(R) = Relief Crew Coordinator



AgriBusiness  
J.R. Simplot Company, Don Plant  
P.O. Box 912 Pocatello, ID 83204  
208-234-5366 Fax 208-234-5493

FOR REFERENCE ONLY

## Don Plant People and Phone Numbers

### General Information

#### Production Department

Production Manager	Kevin Armstrong	208-234-5399
Phos Acid Manager	Curtis Dunn	208-234-5484
Sr. Granulation Coach	John Oborn	208-234-5346
Sulfuric Manager	Will Snarr	208-234-5332
Sr. Ammonia Coach	Tom Christensen	208-234-5414

#### Maintenance Department

Maintenance Manager	Klay Wagner	208-234-5407
Project Engineering Manager	Dan Smith	208-234-5455
Warehouse/Purchasing Manager	Klay Wagner	208-234-5407
Contract Administrator/Buyer	Lannie Bloom	208-234-5313
Technical Buyer	Dennis Smith	208-234-5393

#### Safety Department

Safety Services Manager	Bill Wall	208-234-5366
PSM Supervisor	Cresta Axenty	208-234-5417
Contractor Safety Coordinator		
Industrial Hygiene Coordinator		
Safety/Health Technician	Vivian Meyer	208-234-5372

#### Environmental Department

Environmental Manager	Leon Pruett	208-234-5370
Environmental Specialist	Jeanene Benson	208-234-5330

#### Medical Department

Plant Nurse	Chris Yensen	208-234-5373
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## Kode of the KOA

### Kontractor On-Site Area

#### I. Structures

- a) Trailers must be in good repair and good general condition. They must comply with current electrical code requirements and have an external electrical connection as shown in the Simplot requirements.
- b) Any structures that are not mounted on wheels need prior approval from the Project Engineering Manager before their construction or placement.
- c) Any temporary buildings for sheltering work areas covered with visqueen or plastic will only be allowed for one (1) month, unless permitted by the Project Engineering Manager.
- d) All structures (trailers or buildings) must have appropriate fire extinguisher(s) permanently mounted inside in a conspicuous location.
- e) All fire extinguishers must be inspected monthly, and the inspection tag must be updated with the current date.
- f) Storage of combustible materials under the trailers is **NOT allowed**.
- g) Trailers will be located in the contractor's designated area as shown on the site map. They must be oriented as instructed, to minimize electrical power runs and interference with adjacent contractors. The trailers will usually be oriented North-South.
- h) In the event that a contractor will not have work in the plant for an extended period of time, they will remove all trailers, structures, equipment and materials from the plant.

#### II. Environmental

- a) Hazardous waste should be placed in the Satellite Accumulation Site closest to the point of generation in accordance with EPA regulations.
- b) Chemicals that are not already on Simplot's MSDS *List of Acceptable Chemicals*, must first be approved using Simplot's *Chemical Approval Procedure* (#34) before they are brought into the plant.

## Continued...Kode of the KOA

### III. Electrical

- a) All electrical power connections will be made to the existing power panels in the KOA.
- b) Per Simplot's E&I Departmental requirements, each contractor is expected to provide their own buried conduit, wiring and pedestal with breakers/disconnect for providing power to their trailer.
- c) In the event that temporary additional power is needed, the cords supplying that power cannot be placed in trafficways and cannot be in place for more than two (2) weeks.
- d) All extension cords must have GFIC protection.

### IV. General

- a) Proper housekeeping must be maintained in the KOA at all times – tools and materials must be kept in a neat and orderly manner.
- b) Contractors will be expected to keep their work and eating areas neat and clean.
- c) Each contractor will be expected to have a representative at the weekly Contractor Safety Meeting, which is held every Monday morning at 8:30 a.m. in the Maintenance Conference Room.
- d) Each contractor should bring their *completed* Weekly Audit Form and present any safety comments or concerns at that weekly meeting.
- e) The J.R. Simplot Company will periodically conduct audits of the Kontractor On-Site Area (KOA) to ensure that all requirements are being met.
- f) The Contractor is expected to correct any deficiencies found during these audits to the satisfaction of the J.R. Simplot Company.
- g) Failure to comply with these rules **will not be tolerated** and will be cause to reconsider a contractor's suitability for future work in the plant.
- h) All contractor facilities and equipment must meet OSHA, ANSI and other applicable safety requirements while located on Simplot's Don Plant site.
- i) Portable toilets will be supplied by Simplot.



## APPENDIX D

**APPENDIX D**

**DAILY SAFETY MEETING ATENDANCE FORM**

# DAILY SAFETY MEETING ATTENDANCE FORM

MFG, Inc.

Project Name: \_\_\_\_\_

Date: \_\_\_\_\_ Time: \_\_\_\_\_

Project Number: \_\_\_\_\_

Presented by: \_\_\_\_\_

Signature: \_\_\_\_\_

## Check the Topics/Information Reviewed:

- |   |   |   |
|---|---|---|
| <input type="checkbox"/> safety glasses, hard hat, safety boots         | <input type="checkbox"/> slips, trips, and falls          | <input type="checkbox"/> daily work scope       |
| <input type="checkbox"/> site safety plan review and location           | <input type="checkbox"/> directions to hospital/first aid | <input type="checkbox"/> emergency protocol     |
| <input type="checkbox"/> equipment and machinery familiarization        | <input type="checkbox"/> anticipated visitors             | <input type="checkbox"/> parking and lay down   |
| <input type="checkbox"/> employee Right-To-Know/MSDS location           | <input type="checkbox"/> electrical ground fault          | <input type="checkbox"/> hot work permits       |
| <input type="checkbox"/> open pits, excavations, and site hazards       | <input type="checkbox"/> public safety and fences         | <input type="checkbox"/> strains and sprains    |
| <input type="checkbox"/> vehicle safety and driving/road conditions     | <input type="checkbox"/> excavator swing and loading      | <input type="checkbox"/> noise hazards          |
| <input type="checkbox"/> portable tool safety and awareness             | <input type="checkbox"/> orderly site and housekeeping    | <input type="checkbox"/> no horseplay           |
| <input type="checkbox"/> overhead utility locations and clearance       | <input type="checkbox"/> smoking in designated areas      | <input type="checkbox"/> heat and cold stress   |
| <input type="checkbox"/> first aid, safety, and PPE location            | <input type="checkbox"/> leather gloves for protection    | <input type="checkbox"/> backing up hazards     |
| <input type="checkbox"/> sharp object, rebar, and scrap metal hazards   | <input type="checkbox"/> effects of the night before      | <input type="checkbox"/> accidents are costly   |
| <input type="checkbox"/> safety is everyone's responsibility            | <input type="checkbox"/> vibration related injuries       | <input type="checkbox"/> dust and vapor control |
| <input type="checkbox"/> inner gloves/outer gloves                      | <input type="checkbox"/> fire extinguisher locations      | <input type="checkbox"/> refueling procedures   |
| <input type="checkbox"/> excavation/trenching inspections/documentation | <input type="checkbox"/> eye wash station locations       | <input type="checkbox"/> confined space entry   |
| <input type="checkbox"/> full face respirators with proper cartridges   | <input type="checkbox"/> decontamination procedures       | <input type="checkbox"/> Safety is No Accident  |
| <input type="checkbox"/> location and operation of kill switch          |   |   |

☐ upgrade to level C at: PID ( \_\_\_ eV ) > \_\_\_ ppm

☐ work stoppage at: PID ( \_\_\_ eV ) > \_\_\_ ppm, % LEL > 10%

Discussion/Comments/Follow-up Actions: \_\_\_\_\_

NAME	SIGNATURE	COMPANY

### Instructions:

- Conduct a daily safety meeting prior to beginning each day's site activities.
- Complete form, obtain signatures, and file with the Daily Summary.
- Follow-up on any noted items and document resolution of any action items.



## APPENDIX E

**APPENDIX E**

**MATERIAL SAFETY DATA SHEETS**

**Beryllium**

**Cadmium**

**Chromium**

**Fluoride**

**Lead**

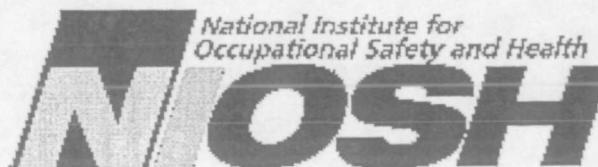
**Silver**

**Vanadium**

# International Chemical Safety Cards

## BERYLLIUM

ICSC: 0226



Glucinium

Be

Atomic mass: 9.0

ICSC # 0226

CAS # 7440-41-7

RTECS # DS1750000

UN # 1567

EC # 004-001-00-7



TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
<b>FIRE</b>	Combustible.	NO open flames.	Special powder, dry sand, NO other agents.
<b>EXPLOSION</b>	Finely dispersed particles form explosive mixtures in air.	Prevent deposition of dust; closed system, dust explosion-proof electrical equipment and lighting.	
<b>EXPOSURE</b>		PREVENT DISPERSION OF DUST! AVOID ALL CONTACT!	IN ALL CASES CONSULT A DOCTOR!
<b>•INHALATION</b>	Cough. Shortness of breath. Sore throat. Weakness. Symptoms may be delayed (see Notes).	Local exhaust. Breathing protection.	Fresh air, rest. Refer for medical attention.
<b>•SKIN</b>	Redness.	Protective gloves. Protective clothing.	Remove contaminated clothes. Rinse skin with plenty of water or shower.
<b>•EYES</b>	Redness. Pain.	Face shield or eye protection in combination with breathing protection if powder.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.


<b>•INGESTION</b>	Do not eat, drink, or smoke during work. Wash hands before eating.	Rinse mouth. Do NOT induce vomiting. Refer for medical attention.
SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Evacuate danger area! Consult an expert! Carefully collect the spilled substance into containers; if appropriate moisten first, then remove to safe place. Chemical protection suit including self-contained breathing apparatus. Do NOT let this chemical enter the environment.	Separated from strong acids, bases food and feedstuffs	Unbreakable packaging; put breakable packaging into closed unbreakable container. Do not transport with food and feedstuffs. Note: E T+ symbol R: 49-25-26-36/37/38-43-48/23 S: 53-45 UN Hazard Class: 6.1 UN Subsidiary Risks: 4.1 UN Packing Group: II
SEE IMPORTANT INFORMATION ON BACK		
ICSC: 0226	Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities (C) IPCS CEC 2000. No modifications to the International version have been made except to add the OSHA PELs, NIOSH RELs and NIOSH IDLH values.	

# International Chemical Safety Cards

## BERYLLIUM

ICSC: 0226

I M P O R T A N T D	<p><b>PHYSICAL STATE; APPEARANCE:</b> GREY TO WHITE POWDER.</p> <p><b>PHYSICAL DANGERS:</b> Dust explosion possible if in powder or granular form, mixed with air.</p> <p><b>CHEMICAL DANGERS:</b> Reacts strong acids strong bases forming flammable/explosive gas (hydrogen - see ICSC0001) Forms shock sensitive mixtures with some chlorinated solvents, such as carbon tetrachloride and trichloroethylene.</p> <p><b>OCCUPATIONAL EXPOSURE LIMITS:</b> TLV (as TWA): ppm; 0.002 mg/m<sup>3</sup> A1 (ACGIH 1999). TLV (as STEL ): ppm; 0.01 mg/m<sup>3</sup> (ACGIH 1999).</p>	<p><b>ROUTES OF EXPOSURE:</b> The substance can be absorbed into the body by inhalation of its aerosol and by ingestion.</p> <p><b>INHALATION RISK:</b> Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly when dispersed.</p> <p><b>EFFECTS OF SHORT-TERM EXPOSURE:</b> The aerosol of this substance irritates the respiratory tract. Inhalation of dust or fumes may cause chemical pneumonitis. Exposure may result in death. The effects may be delayed. Medical observation is indicated.</p> <p><b>EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:</b></p>
--	--	---

A T A	NIOSH REL: Ca Not to exceed 0.0005 mg/m <sup>3</sup> See Appendix A NIOSH IDLH: Potential occupational carcinogen 4 mg/m <sup>3</sup> (as Be)	Repeated or prolonged contact may cause skin sensitization. Lungs may be affected by repeated or prolonged exposure to dust particles, resulting in chronic beryllium disease (cough, weight loss, weakness). This substance is carcinogenic to humans.
PHYSICAL PROPERTIES	Boiling point: above 2500°C Melting point: 1287°C Density: 1.9 g/cm <sup>3</sup>	Solubility in water: none
ENVIRONMENTAL DATA	The substance is very toxic to aquatic organisms.	
NOTES		
Depending on the degree of exposure, periodic medical examination is indicated. Do NOT take working clothes home. Transport Emergency Card: TEC (R)-61G64b NFPA Code: H3; F1; R0		
ADDITIONAL INFORMATION		
ICSC: 0226 (C) IPCS, CEC, 2000 BERYLLIUM		

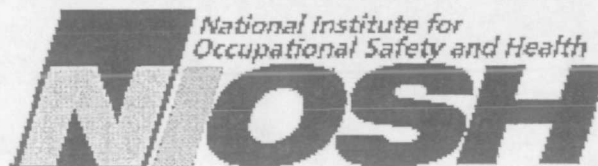
**IMPORTANT LEGAL NOTICE:**

Neither NIOSH, the CEC or the IPCS nor any person acting on behalf of NIOSH, the CEC or the IPCS is responsible for the use which might be made of this information. This card contains the collective views of the IPCS Peer Review Committee and may not reflect in all cases all the detailed requirements included in national legislation on the subject. The user should verify compliance of the cards with the relevant legislation in the country of use. The only modifications made to produce the U.S. version is inclusion of the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

# International Chemical Safety Cards

## CADMIUM

ICSC: 0020



Cd

Atomic mass: 112.4

ICSC # 0020

CAS # 7440-43-9

RTECS # EU9800000

UN #

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
<b>FIRE</b>	Flammable in powder form. Gives off irritating or toxic fumes (or gases) in a fire.	NO open flames, NO sparks, and NO smoking. NO contact with heat or acids.	Dry sand. Special powder. No other agents.
<b>EXPLOSION</b>	Finely dispersed particles form explosive mixtures in air.	Prevent deposition of dust; closed system, dust explosion-proof electrical equipment and lighting.	
<b>EXPOSURE</b>		PREVENT DISPERSION OF DUST! STRICT HYGIENE!	IN ALL CASES CONSULT A DOCTOR!
<b>•INHALATION</b>	Cough. Headache. Symptoms may be delayed (see Notes).	Local exhaust or breathing protection.	Fresh air, rest. Half-upright position. Artificial respiration if indicated. Refer for medical attention.
<b>•SKIN</b>		Protective gloves.	Remove contaminated clothes. Rinse and then wash skin with water and soap.
<b>•EYES</b>	Redness. Pain.	Face shield or eye protection in combination with breathing protection.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
<b>•INGESTION</b>	Abdominal pain. Diarrhoea. Headache. Nausea. Vomiting.	Do not eat, drink, or smoke during work.	Rest. Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Evacuate danger area! Extinguish ignition sources. Sweep spilled substance into containers; if appropriate, moisten first to prevent dusting. Carefully collect remainder, then remove to safe place (extra personal protection: P3 filter respirator for toxic particles).	Fireproof. Separated from strong oxidants, strong acids, food and feedstuffs.	Airtight. Unbreakable packaging; put breakable packaging into closed unbreakable container. Do not transport with food and feedstuffs. R: S: UN Hazard Class:
SEE IMPORTANT INFORMATION ON BACK		
ICSC: 0020	Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities (C) IPCS CEC 1999. No modifications to the International version have been made except to add the OSHA PELs, NIOSH RELs and NIOSH IDLH values.	

# International Chemical Safety Cards

## CADMIUM

ICSC: 0020

I  
M  
P  
O  
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A  
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T  
A**PHYSICAL STATE; APPEARANCE:**

SOFT BLUE-WHITE METAL LUMPS OR GREY POWDER. MALLEABLE. TURNS BRITTLE ON EXPOSURE TO 80°C AND TARNISHES ON EXPOSURE TO MOIST AIR.

**PHYSICAL DANGERS:**

Dust explosion possible if in powder or granular form, mixed with air.

**CHEMICAL DANGERS:**

Reacts with acids giving off flammable hydrogen gas. Dust reacts with oxidants, hydrogen azide, zinc, selenium or tellurium, causing fire and explosion hazard.

**OCCUPATIONAL EXPOSURE LIMITS:**

TLV (as dust): ppm; 0.05 mg/m<sup>3</sup> as TWA (ACGIH 1991-1992).  
NIOSH REL: Ca See Appendix A \*Note: The REL applies to all Cadmium compounds (as Cd).  
NIOSH IDLH: Potential occupational carcinogen 9 mg/m<sup>3</sup> (as Cd)

**ROUTES OF EXPOSURE:**

The substance can be absorbed into the body by inhalation of its aerosol and by ingestion.

**INHALATION RISK:**

Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly.

**EFFECTS OF SHORT-TERM EXPOSURE:**

The substance irritates the eyes and the respiratory tract. Inhalation of fume may cause lung oedema (see Notes). Inhalation of fume may cause metal fever. The effects may be delayed. Medical observation is indicated.

**EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:**

Lungs may be affected by repeated or prolonged exposure to dust particles. The substance may have effects on the kidneys, resulting in proteinuria and kidney dysfunction. This substance is probably carcinogenic to humans.

<b>PHYSICAL PROPERTIES</b>	Boiling point: 765°C	Solubility in water: none
	Melting point: 321°C	Auto-ignition temperature: (cadmium metal dust) 250°C
<b>ENVIRONMENTAL DATA</b>	Relative density (water = 1): 8.6	

**NOTES**

Reacts violently with fire extinguishing agents such as water, foam, carbon dioxide and halons. Depending on the degree of exposure, periodic medical examination is indicated. The symptoms of lung oedema often do not become manifest until a few hours have passed and they are aggravated by physical effort. Rest and medical observation are therefore essential. Do NOT take working clothes home.

**ADDITIONAL INFORMATION****ICSC: 0020****CADMIUM**

(C) IPCS, CEC, 1999

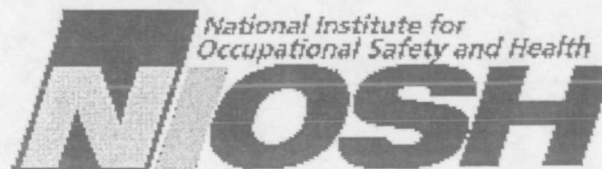
**IMPORTANT LEGAL NOTICE:**

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# International Chemical Safety Cards

## CHROMIUM

ICSC: 0029



Chrome  
Cr (metal)  
Atomic mass: 52.0

ICSC # 0029

CAS # 7440-47-3

RTECS # GB4200000

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
<b>FIRE</b>	Combustible if in very fine powder. Gives off irritating or toxic fumes (or gases) in a fire.	No open flames if in powder form.	In case of fire in the surroundings: all extinguishing agents allowed.
<b>EXPLOSION</b>	Finely dispersed particles form explosive mixtures in air.	Prevent deposition of dust; closed system, dust explosion-proof electrical equipment and lighting.	
<b>EXPOSURE</b>		PREVENT DISPERSION OF DUST! STRICT HYGIENE!	
• <b>INHALATION</b>	Cough.	Local exhaust or breathing protection.	Fresh air, rest.
• <b>SKIN</b>	Redness.	Protective gloves.	Remove contaminated clothes. Rinse skin with plenty of water or shower. Refer for medical attention.
• <b>EYES</b>	Redness.	Face shield.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
• <b>INGESTION</b>		Do not eat, drink, or smoke during work.	Rinse mouth.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Vacuum spilled material. Carefully collect remainder, then remove to safe place (extra personal protection: P2 filter respirator for harmful particles).	Fireproof. Separated from strong oxidants.	R: S:
SEE IMPORTANT INFORMATION ON BACK		
ICSC: 0029	Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities (C) IPCS CEC 1999. No modifications to the International version have been made except to add the OSHA PELs, NIOSH RELs and NIOSH IDLH values.	

# International Chemical Safety Cards

## CHROMIUM

ICSC: 0029

I M P O R T A N T D A T A	<b>PHYSICAL STATE; APPEARANCE:</b> STEEL GREY LUTROUS METAL.	<b>ROUTES OF EXPOSURE:</b> The substance can be absorbed into the body by inhalation of its aerosol and by ingestion.
	<b>PHYSICAL DANGERS:</b> Dust explosion possible if in powder or granular form, mixed with air.	<b>INHALATION RISK:</b> Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly when dispersed.
	<b>CHEMICAL DANGERS:</b> Reacts violently with strong oxidants such as hydrogen peroxide, causing fire and explosion hazard. Reacts with diluted hydrochloric and sulfuric acids. Incompatible with alkalis and alkali carbonates.	<b>EFFECTS OF SHORT-TERM EXPOSURE:</b>
	<b>OCCUPATIONAL EXPOSURE LIMITS:</b> TLV: ppm; 0.5 mg/m <sup>3</sup> (as TWA) (ACGIH 1994-1995). OSHA PEL*: TWA 1 mg/m <sup>3</sup> See Appendix C *Note: The PEL also applies to insoluble chromium salts. NIOSH REL: TWA 0.5 mg/m <sup>3</sup> See Appendix C NIOSH IDLH: 250 mg/m <sup>3</sup> (as Cr)	<b>EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:</b> Repeated or prolonged contact may cause skin sensitization.
<b>PHYSICAL PROPERTIES</b>	Boiling point: 2642°C Melting point: 1900°C	Relative density (water = 1): 7.14 Solubility in water: none

**ENVIRONMENTAL  
DATA**

**NOTES**

Explosive limits are unknown in literature. Depending on the degree of exposure, periodic medical examination is indicated.

**ADDITIONAL INFORMATION**

**ICSC: 0029**

**CHROMIUM**

(C) IPCS, CEC, 1999

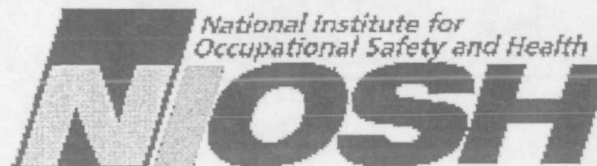
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# International Chemical Safety Cards

## CALCIUM FLUORIDE

ICSC: 1323



Calcium difluoride

CaF<sub>2</sub>

Molecular mass: 78.1

ICSC # 1323

CAS # 7789-75-5

RTECS # EW1760000

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
<b>FIRE</b>	Not combustible.		In case of fire in the surroundings: all extinguishing agents allowed.
<b>EXPLOSION</b>			
<b>EXPOSURE</b>		PREVENT DISPERSION OF DUST!	
•INHALATION		Ventilation (not if powder), local exhaust, or breathing protection.	Fresh air, rest.
•SKIN		Protective gloves.	Rinse and then wash skin with water and soap.
•EYES		Safety spectacles.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
•INGESTION	Nausea. Vomiting.	Do not eat, drink, or smoke during work.	Rinse mouth.
<b>SPILLAGE DISPOSAL</b>		<b>STORAGE</b>	<b>PACKAGING &amp; LABELLING</b>

Sweep spilled substance into containers; if appropriate, moisten first to prevent dusting. Carefully collect remainder, then remove to safe place. (Extra personal protection: P2 filter respirator for harmful particles).

Separated from mineral acids.

R:  
S:

### SEE IMPORTANT INFORMATION ON BACK

ICSC: 1323

Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities (C) IPCS CEC 2000. No modifications to the International version have been made except to add the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

# International Chemical Safety Cards

## CALCIUM FLUORIDE

ICSC: 1323

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**PHYSICAL STATE; APPEARANCE:**  
COLOURLESS CRYSTALS WHITE  
HYGROSCOPIC POWDER

**PHYSICAL DANGERS:**

**CHEMICAL DANGERS:**  
On combustion, forms toxic fumes of fluoride. Reacts with acids to produce

**OCCUPATIONAL EXPOSURE LIMITS:**  
TLV (fluorides as F): 2.5 mg/m<sup>3</sup> A4 (as TWA) (ACGIH 1998).  
MAK as F: ppm; 2.5 mg/m<sup>3</sup>; (1998)

**ROUTES OF EXPOSURE:**

The substance can be absorbed into the body by inhalation of its aerosol and by ingestion.

**INHALATION RISK:**

Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly on spraying.

**EFFECTS OF SHORT-TERM EXPOSURE:**

**EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:**

### PHYSICAL PROPERTIES

Boiling point: 2500°C  
Melting point: 1403°C  
Density: 3.2 g/cm<sup>3</sup>

Solubility in water: none at 20 °C

**ENVIRONMENTAL  
DATA**

**NOTES**

**ADDITIONAL INFORMATION**

**ICSC: 1323**

**CALCIUM FLUORIDE**

(C) IPCS, CEC, 2000

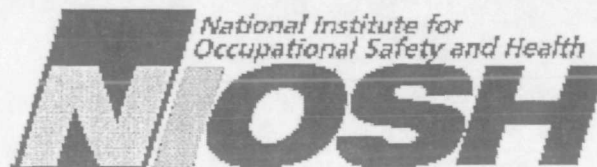
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# International Chemical Safety Cards

## LEAD

ICSC: 0052



Lead metal

Plumbum

Pb

Atomic mass: 207.2

(powder)

Atomic mass: Atomic mass: 207.2

ICSC # 0052

CAS # 7439-92-1

RTECS # OF7525000

UN #

EC #

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
<b>FIRE</b>	Not combustible. Finely divided lead powder is flammable. Gives off irritating or toxic fumes (or gases) in a fire.	NO open flames, NO sparks, and NO smoking (if in powder form).	In case of fire in the surroundings: all extinguishing agents allowed.
<b>EXPLOSION</b>	Finely dispersed particles form explosive mixtures in air.	Prevent deposition of dust; closed system, dust explosion-proof electrical equipment and lighting.	
<b>EXPOSURE</b>		PREVENT DISPERSION OF DUST! STRICT HYGIENE! AVOID EXPOSURE OF (PREGNANT) WOMEN! AVOID EXPOSURE OF ADOLESCENTS AND CHILDREN!	IN ALL CASES CONSULT A DOCTOR!

• <b>INHALATION</b>	Abdominal cramps. Drowsiness. Headache. Nausea. Vomiting. Weakness. Pallor. Hemoglobinuria. Collapse.	Ventilation (not if powder). Avoid inhalation of fine dust and mist. Local exhaust or breathing protection.	Fresh air, rest. Refer for medical attention.
• <b>SKIN</b>			
• <b>EYES</b>			
• <b>INGESTION</b>	Abdominal cramps (further see Inhalation).	Do not eat, drink, or smoke during work. Wash hands before eating.	Rinse mouth. Induce vomiting (ONLY IN CONSCIOUS PERSONS!). Refer for medical attention.

SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Sweep spilled substance into containers; if appropriate, moisten first to prevent dusting. Carefully collect remainder, then remove to safe place. Do NOT let this chemical enter the environment (extra personal protection: P2 filter respirator for harmful particles).	Separated from strong oxidants, strong bases, strong acids, food and feedstuffs.	R: S: UN Hazard Class:

**SEE IMPORTANT INFORMATION ON BACK****ICSC: 0052**

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# International Chemical Safety Cards

**LEAD****ICSC: 0052**

I M P O R T	<b>PHYSICAL STATE; APPEARANCE:</b> BLUISH-WHITE OR SILVERY-GREY SOLID IN VARIOUS FORMS. TURNS TARNISHED ON EXPOSURE TO AIR.	<b>ROUTES OF EXPOSURE:</b> The substance can be absorbed into the body by inhalation of its aerosol and by ingestion.
	<b>PHYSICAL DANGERS:</b> Dust explosion possible if in powder or granular form, mixed with air.	<b>INHALATION RISK:</b> Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly.
	<b>CHEMICAL DANGERS:</b> Upon heating, toxic fumes are formed. Reacts with hot concentrated nitric acid, boiling concentrated hydrochloric and sulfuric acids. Attacked by pure water and by weak organic	<b>EFFECTS OF SHORT-TERM EXPOSURE:</b> The substance may cause effects on the gastrointestinal tract, blood, central nervous system and kidneys, resulting in colics,

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acids in the presence of oxygen.

**OCCUPATIONAL EXPOSURE LIMITS:**TLV: ppm; 0.15 mg/m<sup>3</sup> (as TWA) (ACGIH 1993-1994).OSHA PEL\*: 1910.1025 TWA 0.050 mg/m<sup>3</sup>

See Appendix C \*Note: The PEL also applies to other lead

NIOSH REL\*: TWA 0.050 mg/m<sup>3</sup> See

Appendix C \*Note: The REL also applies to other lead

NIOSH IDLH: 100 mg/m<sup>3</sup> (as Pb)

shock, anemia, kidney damage and encephalopathy. Exposure may result in death. The effects may be delayed. Medical observation is indicated.

**EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:**

The substance may have effects on the gastrointestinal tract, nervous system, blood, kidneys and immune system, resulting in severe lead colics, paralysis of muscle groups of the upper extremities (forearm, wrist and fingers), anemia, mood and personality changes, retarded mental development, and irreversible nephropathy. May cause retarded development of the new-born. Danger of cumulative effect.

**PHYSICAL PROPERTIES**

Boiling point: 1740°C  
Melting point: 327.5°C

Relative density (water = 1): 11.34  
Solubility in water: none

**ENVIRONMENTAL DATA**

This substance may be hazardous to the environment; special attention should be given to air and water. In the food chain important to humans, bioaccumulation takes place, specifically in plants and water organisms, especially shellfish.

**NOTES**

Explosive limits are unknown in literature. Use of alcoholic beverages enhances the harmful effect. Depending on the degree of exposure, periodic medical examination is indicated. Do NOT take working clothes home. Refer also to cards for specific lead compounds, e.g., lead chromate (ICSC # 0003), lead(II) oxide (ICSC # 0288).

Transport Emergency Card: TEC (R)-61G12b

**ADDITIONAL INFORMATION**

ICSC: 0052

**LEAD**

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# International Chemical Safety Cards

## SILVER

ICSC: 0810



Argentium

C.I. 77820

Ag

Atomic mass: 107.9

Atomic mass: Atomic mass: 107.9

ICSC # 0810

CAS # 7440-22-4

RTECS # VW3500000

TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
<b>FIRE</b>	Not combustible, except as powder.		
<b>EXPLOSION</b>			
<b>EXPOSURE</b>		PREVENT DISPERSION OF DUST!	
• <b>INHALATION</b>		Local exhaust or breathing protection.	Fresh air, rest.
• <b>SKIN</b>		Protective gloves.	Rinse skin with plenty of water or shower.
• <b>EYES</b>		Safety spectacles, or eye protection in combination with breathing protection if powder.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.
• <b>INGESTION</b>		Do not eat, drink, or smoke during work.	
<b>SPILLAGE DISPOSAL</b>		<b>STORAGE</b>	<b>PACKAGING &amp; LABELLING</b>

Sweep spilled substance into containers; if appropriate, moisten first to prevent dusting. Carefully collect remainder, then remove to safe place. Do NOT let this chemical enter the environment.

Separated from ammonia, strong hydrogen peroxide solutions, strong acids.

R:  
S:

### SEE IMPORTANT INFORMATION ON BACK

ICSC: 0810

Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities (C) IPCS CEC 2001. No modifications to the International version have been made except to add the OSHA PELs, NIOSH RELs and NIOSH IDLH values.

# International Chemical Safety Cards

SILVER

ICSC: 0810

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**PHYSICAL STATE; APPEARANCE:**  
WHITE METAL, TURNS DARK ON EXPOSURE TO OZONE, HYDROGEN SULFIDE OR SULFUR.

#### PHYSICAL DANGERS:

#### CHEMICAL DANGERS:

Shock-sensitive compounds are formed with acetylene. Reacts with acids causing fire hazard. Contact with strong hydrogen peroxide solution will cause violent decomposition to oxygen gas. Contact with ammonia may cause formation of compounds that are explosive when dry.

#### OCCUPATIONAL EXPOSURE LIMITS:

TLV (metal): 0.1 mg/m<sup>3</sup> (ACGIH 1997).  
MAK: 0.1 mg/m<sup>3</sup>; (1996)  
NIOSH REL: TWA 0.01 mg/m<sup>3</sup>  
NIOSH IDLH: 10 mg/m<sup>3</sup> (as Ag)

#### ROUTES OF EXPOSURE:

The substance can be absorbed into the body by inhalation and by ingestion.

#### INHALATION RISK:

Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly when dispersed.

#### EFFECTS OF SHORT-TERM EXPOSURE:

Inhalation of high amounts of metallic silver vapours may cause lung damage with pulmonary oedema.

#### EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:

The substance may cause a grey-blue discoloration of the eyes, nose, throat and skin (argyria/argyrosis).

#### PHYSICAL PROPERTIES

Boiling point: 2212°C  
Melting point: 962°C

Relative density (water = 1): 10.5  
Solubility in water: none

#### ENVIRONMENTAL DATA

This substance may be hazardous to the environment; special attention should be given to aquatic organisms.



**NOTES**

**ADDITIONAL INFORMATION**

**ICSC: 0810**

**SILVER**

(C) IPCS, CEC, 2001

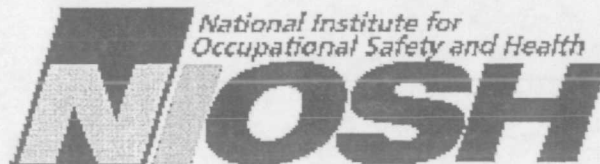
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# International Chemical Safety Cards

## VANADIUM TRIOXIDE

ICSC: 0455



Divanadium trioxide  
 Vanadium sesquioxide  
 Vanadic oxide  
 Vanadium(III) oxide  
 $V_2O_3$   
 Molecular mass: 149.9

ICSC # 0455  
 CAS # 1314-34-7  
 RTECS # YW3050000  
 UN # 3285



TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
<b>FIRE</b>	Combustible under specific conditions. Gives off irritating or toxic fumes (or gases) in a fire.	NO open flames.	In case of fire in the surroundings: all extinguishing agents allowed.
<b>EXPLOSION</b>			
<b>EXPOSURE</b>		PREVENT DISPERSION OF DUST!	
• <b>INHALATION</b>	Sore throat. Cough. Laboured breathing. Weakness.	Local exhaust or breathing protection.	Fresh air, rest. Half-upright position. Refer for medical attention.
• <b>SKIN</b>	Dry skin. Redness.	Protective gloves.	Remove contaminated clothes. Rinse skin with plenty of water or shower.
• <b>EYES</b>	Redness.	Safety goggles, or eye protection in combination with breathing protection if powder.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.

<b>•INGESTION</b>	Headache. Vomiting. Weakness.	Do not eat, drink, or smoke during work.	Induce vomiting (ONLY IN CONSCIOUS PERSONS!). Give plenty of water to drink. Refer for medical attention.
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SPILLAGE DISPOSAL	STORAGE	PACKAGING & LABELLING
Sweep spilled substance into containers; if appropriate, moisten first to prevent dusting. Carefully collect remainder, then remove to safe place. (Extra personal protection: P3 filter respirator for toxic particles).	Separated from food and feedstuffs.	Do not transport with food and feedstuffs. R: S: UN Hazard Class: 6.1 UN Packing Group: III

**SEE IMPORTANT INFORMATION ON BACK****ICSC: 0455**

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# International Chemical Safety Cards

## VANADIUM TRIOXIDE

**ICSC: 0455**

<b>I M P O R T A N T  D A T</b>	<p><b>PHYSICAL STATE; APPEARANCE:</b> BLACK POWDER, TURNS GRADUALLY INTO INDIGO-BLUE CRYSTALS OF VANADIUM TETROXIDE (V<sub>2</sub>O<sub>4</sub>) ON EXPOSURE TO AIR.</p> <p><b>PHYSICAL DANGERS:</b></p> <p><b>CHEMICAL DANGERS:</b> The substance decomposes on heating or on burning producing irritating and toxic fumes (vanadium oxides).</p> <p><b>OCCUPATIONAL EXPOSURE LIMITS:</b> TLV not established. MAK not established.</p>	<p><b>ROUTES OF EXPOSURE:</b> The substance can be absorbed into the body by inhalation of its aerosol and by ingestion.</p> <p><b>INHALATION RISK:</b> Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly.</p> <p><b>EFFECTS OF SHORT-TERM EXPOSURE:</b> The aerosol irritates the eyes, the skin and the respiratory tract. Inhalation of high concentrations of aerosol of this substance may cause conjunctivitis, rhinitis and bronchitis. The effects may be delayed. See Notes.</p> <p><b>EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:</b> The substance may have effects on the respiratory tract, resulting in chronic rhinitis and chronic bronchitis.</p>
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**PHYSICAL  
PROPERTIES**

Melting point: 1970°C  
Density: 4.87 g/cm<sup>3</sup> at 18°C

Solubility in water: poor

**ENVIRONMENTAL  
DATA****NOTES**

Depending on the degree of exposure, periodic medical examination is indicated. The symptoms of acute exposure do not become manifest until 1-6 days. Also consult ICSC # 0596 Vanadium pentoxide.

Transport Emergency Card: TEC (R)-61G65c

**ADDITIONAL INFORMATION**

ICSC: 0455

**VANADIUM TRIOXIDE**

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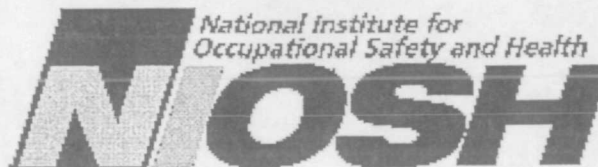
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# International Chemical Safety Cards

## VANADIUM PENTOXIDE

ICSC: 0596



Divanadium pentoxide  
Vanadic anhydride  
Vanadium(V)oxide  
 $V_2O_5$

Molecular mass: 181.9

ICSC # 0596

CAS # 1314-62-1

RTECS # YW2450000 (dust)

UN # 2862

EC # 023-001-00-8



TYPES OF HAZARD/ EXPOSURE	ACUTE HAZARDS/ SYMPTOMS	PREVENTION	FIRST AID/ FIRE FIGHTING
<b>FIRE</b>	Not combustible.		In case of fire in the surroundings: all extinguishing agents allowed.
<b>EXPLOSION</b>			
<b>EXPOSURE</b>		PREVENT DISPERSION OF DUST! STRICT HYGIENE!	
• <b>INHALATION</b>	Sore throat. Cough. Burning sensation. Shortness of breath. Laboured breathing. Wheezing.	Ventilation, local exhaust, or breathing protection.	Fresh air, rest. Half-upright position. Refer for medical attention.
• <b>SKIN</b>	Redness. Burning sensation. Pain.	Protective gloves.	Remove contaminated clothes. Rinse skin with plenty of water or shower.
• <b>EYES</b>	Pain. Redness. Conjunctivitis.	Safety goggles, or eye protection in combination with breathing protection if powder.	First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then take to a doctor.

•INGESTION	Abdominal cramps. Diarrhoea. Drowsiness. Nausea. Unconsciousness. Vomiting.	Do not eat, drink, or smoke during work. Wash hands before eating.	Induce vomiting (ONLY IN CONSCIOUS PERSONS!). Give plenty of water to drink. Refer for medical attention.
SPILLAGE DISPOSAL		STORAGE	PACKAGING & LABELLING
Sweep spilled substance into containers; if appropriate, moisten first to prevent dusting. Carefully collect remainder, then remove to safe place. (Extra personal protection: P3 filter respirator for toxic particles). Do NOT let this chemical enter the environment.		Separated from food and feedstuffs.	Do not transport with food and feedstuffs. T symbol N symbol R: 20/22-37-40-48/23-51/53-63 S: 1/2-36/37-38-45-61 UN Hazard Class: 6.1 UN Packing Group: III
SEE IMPORTANT INFORMATION ON BACK			
ICSC: 0596		Prepared in the context of cooperation between the International Programme on Chemical Safety & the Commission of the European Communities (C) IPCS CEC 1999. No modifications to the International version have been made except to add the OSHA PELs, NIOSH RELs and NIOSH IDLH values.	

# International Chemical Safety Cards

## VANADIUM PENTOXIDE

ICSC: 0596

<b>I M P O R T A N T D A</b>	<b>PHYSICAL STATE; APPEARANCE:</b> YELLOW TO RED CRYSTALLINE POWDER OR SOLID IN VARIOUS FORMS.  <b>PHYSICAL DANGERS:</b>  <b>CHEMICAL DANGERS:</b> Upon heating, toxic fumes are formed. Reacts with combustible substances  <b>OCCUPATIONAL EXPOSURE LIMITS:</b> TLV (respirable dust or fume, as V <sub>2</sub> O <sub>5</sub> ): 0.05 mg/m <sup>3</sup> (TWA) (ACGIH 1999). MAK: 0.05 mg/m <sup>3</sup> ; (1996). OSHA PEL: C 0.1 mg V <sub>2</sub> O <sub>5</sub> /m <sup>3</sup> NIOSH REL*: C 0.05 mg V/m <sup>3</sup> 15-minute *Note: The REL applies to all vanadium compounds except	<b>ROUTES OF EXPOSURE:</b> The substance can be absorbed into the body by inhalation of its aerosol and by ingestion.  <b>INHALATION RISK:</b> Evaporation at 20°C is negligible; a harmful concentration of airborne particles can, however, be reached quickly when dispersed.  <b>EFFECTS OF SHORT-TERM EXPOSURE:</b> The aerosol of this substance irritates the eyes, the skin and the respiratory tract. Inhalation of high concentrations may cause lung oedema, bronchitis, bronchospasm. The effects may be delayed.  <b>EFFECTS OF LONG-TERM OR REPEATED EXPOSURE:</b> Lungs may be affected by inhalation of high concentrations of dust or fumes. The
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substance may cause greenish-black  
discolouration of the tongue.

**PHYSICAL  
PROPERTIES**

Boiling point (decomposes): 1750°C  
Melting point: 690°C

Relative density (water = 1): 3.4  
Solubility in water, g/100 ml: 0.8

**ENVIRONMENTAL  
DATA**

The substance is harmful to aquatic organisms.

**NOTES**

Depending on the degree of exposure, periodic medical examination is indicated. The symptoms of lung oedema often do not become manifest until a few hours have passed and they are aggravated by physical effort. Rest and medical observation are therefore essential. Immediate administration of an appropriate spray, by a doctor or a person authorized by him/her, should be considered.

Transport Emergency Card: TEC (R)-61G64c

**ADDITIONAL INFORMATION****ICSC: 0596****VANADIUM PENTOXIDE**

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## APPENDIX F

## **APPENDIX F**

### **MFG PERSONAL PROTECTIVE EQUIPMENT PROGRAM**

- F-1      Levels of Protection**
- F-2      Outline for Selecting Respiratory Protective Devices**
- F-3      Respirator Fit Test Record**

## MFG PERSONAL PROTECTIVE EQUIPMENT PROGRAM

MFG has developed and implemented a personal protective equipment (PPE) program to comply with the requirements of 29 CFR 1910.120 (g)(5). This PPE program contains procedures for:

1. PPE use and limitations;
2. PPE maintenance and storage;
3. PPE decontamination and disposal;
4. PPE training and proper fitting;
5. PPE donning and doffing;
6. PPE inspection prior to, during, and after use;
7. Evaluation of the PPE program effectiveness; and
8. Limitations during temperature extremes and heat stress, and other appropriate medical considerations.

The PPE program also includes a respiratory protection program (RPP) to comply with 29 CFR 1910.134.

The purpose of PPE is to shield individuals from safety and/or health hazards that may be encountered while performing site work. Careful selection, training, use and maintenance of PPE is necessary to minimize the risk to individuals while they are performing work in potentially hazardous environments. The type of PPE to be worn by MFG employees will be evaluated by the degree of exposure to a potential hazard on a site-to-site basis.

The minimum PPE to be worn by MFG employees at most sites will consist of head, eye, foot and, in some cases, hearing protection. On sites where there is a potential for exposure to specific physical hazards or to health hazards other than physical hazards, MFG employees may be required to wear protective clothing and/or respiratory protective devices. The MFG Site Safety Officer will be responsible for determining when conditions warrant upgrading or downgrading the level of protection. The Site Health and Safety Plan will also outline PPE decontamination and disposal procedures, PPE donning and doffing procedures, limitations during temperature extremes and heat stress, etc.

Training in the proper use and limitation, maintenance and storage, fitting, donning and doffing, etc., of PPE will be initially received by employees in an OSHA off-site hazardous materials health and safety course (i.e., 40-hr course). At a minimum, these skills will be maintained by attendance of annual refresher courses. Supplemental training may be provided by qualified MFG personnel, outside

contractors, vendors, etc., on an as needed basis. It is the employee's responsibility to read and become familiar with the manufacturer's instructions concerning, but not limited to, the use, limitation, care, storage, etc., of all PPE.

The PPE program will typically be evaluated on an annual basis. Training and/or literature obtained by MFG personnel will be used to revise and update the procedures, provisions, etc., presented in the following sections. In addition, information, experience, etc., obtained during projects, or knowledge of new techniques, may be used to revise the PPE program at any time.

The following sections briefly describe the use of head, eye, foot, hearing, and respiratory protective equipment. In addition, the use of chemically-resistant clothing is also addressed. Infrequently, employee may be required to use PPE not addressed in these sections for a specific project-related task. On such occasions, the procedures for the use and limitation, maintenance and storage, decontamination and disposal, training and proper fitting, donning and doffing, inspection, evaluation of effectiveness, and medical considerations will be contained in the Site Health and Safety Plan.

#### **F-1.0 Head Protection**

The use of helmets (hard hats) for the protection of heads from impact and penetration from falling and flying objects is specified under 29 CFR 1910.135. In general, MFG employees will be required to wear hard hats when the potential exists for a threat from an overhead object. In many cases, mandatory use of hard hats is required by clients while performing work at any location on their facility.

As specified in 29 CFR 1910.135, MFG will supply employees with head protection that meets the requirements of the American National Standards Institute (ANSI) Standard Z89.1 Requirements for Industrial Head Protection.

The hard hats will be used, cleaned, maintained, etc., by the employee per the manufacturer's instructions. Employees will inspect hard hats prior to each use to ensure that the hat is in proper condition. Use of head protection with structural damage, or alterations that may compromise the structural integrity of the hard hat, is prohibited. If defects are detected, the hat will be exchanged. Any

alterations to the hat such as, but not limited to, drilling of holes, painting, or cleaning with solvents and/or thinners, or modifications to the suspension can compromise the structural integrity of the hat.

#### **F-2.0 Eye and Face Protection**

The use of protective eye and/or face equipment is specified under 29 CFR 1910.133. MFG employees will be required to wear eye protection on all job sites. The type of protection required will be a function of the potential threat and will be specified in the Site Health and Safety Plan. In general, safety glasses with permanently attached side shields will be required when the principal threat is physical (e.g., flying objects). When the potential for splash exists, goggles or face shields may be required.

MFG will supply employees with safety glasses, goggles, and/or face shields that meet the requirements of ANSI Standard Z87.1 Occupational and Educational Eye and Face Protection. For employees who require the use of corrective lenses, MFG will reimburse those individuals for the purchase of one pair of glasses that comply with the above ANSI Standard. The eye glasses must have permanently attached side shields.

Face and eye protection will be used, cleaned, maintained, etc., by the employee per the manufacturer's instructions. Employees will inspect eye and/or face protection prior to each use to ensure that it is in proper condition. Use of eye and face protective equipment with structural or optical defects is prohibited. If defects are detected, the eye or face protection will be exchanged.

#### **F-3.0 Foot Protection**

The use of foot protection (i.e., steel-toe boots) is specified under 29 CFR 1910.136. MFG employees will be required to wear foot protection on all job sites. The construction of the foot protection (e.g., leather, PVC, etc.) will be a function of the potential threat and will be specified in the Site Health and Safety Plan.

MFG will reimburse employees for the purchase of one pair of leather boots and one pair of waterproof (e.g., PVC) boots. On projects that necessitate the purchase of footwear composed of specific chemical resistant materials, MFG will supply personnel with the appropriate footwear.

Employees are responsible for ascertaining that the footwear they purchase complies with the requirements of the ANSI Standard Z41.1 Men's Safety-Toe Footwear. The footwear will be used, cleaned, maintained, etc., by the employee per the manufacturer's instructions. Employees will inspect foot protection prior to each use to ensure that it is in proper condition. Use of footwear with structural defects, worn soles, cracks, etc., is prohibited. If defects are detected, the boots will be exchanged.

#### **F-4.0 Hearing Protection**

Exposure to high noise levels can cause hearing loss or impairment. There is no cure for noise-induced hearing loss, so the prevention of excessive noise exposure is the only way to avoid hearing damage. Protection against the effects of occupational noise exposure is specified in 29 CFR 1910.95. This OSHA standard sets an 8-hour time-weighted-average (TWA) sound exposure level of 90 decibels (dBA); the 8-hour TWA action level is set at 85 dBA.

MFG does not routinely monitor noise levels at job sites. However, it is MFG's policy that hearing protection be used whenever the potential exists for exposure to excessive noise levels. As such, it is the responsibility of the employee to use company-supplied hearing protection whenever project work is performed adjacent to any operating machinery, etc., or the project involves the use of any equipment, tools, etc., no matter how long the duration. The following data, extracted from "*Fundamentals of Industrial Hygiene*"<sup>1</sup> (Table 9-B), are provided as examples of noise levels generated by common activities/equipment: average residence - 40 dBA; noisy office - 80 dBA; passing truck - 100 dBA; and turbo jet engine - 150 dBA.

Disposable earplugs will be used one time, per the manufacturer's instruction, and then discarded. Non-disposable hearing protection will be used, cleaned, maintained, etc., by the employee per the manufacturer's instructions. Employees will inspect hearing protection prior to each use to ensure that it

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<sup>1</sup> National Safety Council, 1988, page 168.

is in proper condition. Use of hearing protection with structural or acoustical damage is prohibited. If defects are detected, the hearing protection will be exchanged.

#### **F-5.0 Chemically Resistant Clothing**

Protective clothing prevents potentially dangerous chemicals from entering the body, usually through the skin. Such clothing also protects the body from burns and cold or wet conditions. Protective clothing can range from gloves to fully encapsulated suits. The chief characteristics of chemical protective clothing include:

1. Strength;
2. Flexibility;
3. Thermal limits; and
4. Chemical resistance.

Strength depends on the material's tensile strength and its resistance to abrasions, punctures, and tears. Flexibility allows the individual to move and work effectively. Gloves especially must be flexible, and in cold weather this is sometimes a problem. Thermal limits refer to the material's ability to maintain its protective capacity in temperature extremes. Thermal limits also affect worker mobility in cold weather and heat transfer in hot weather.

Chemical resistance refers to a material's ability to retain its structural integrity and protective qualities. Material can degrade when a contaminant or chemical reacts with the material. All material eventually degrades. Swelling, shrinking, brittleness, softness, discoloration, elongation or cracking indicates deterioration. These conditions should alert the worker to the possibility that the material is not providing adequate protection.

Chemical resistance can also be described in terms of:

1. Degradation;
2. Breakthrough time;
3. Penetration; and
4. Permeation.

Degradation is the change of the material's physical properties as a result of the chemical's negative effects. Breakthrough time is the time it takes the chemical to pass through the protective material until it is first detected by an analytical instrument. Penetration refers to bulk chemical flow through the protective material. Penetration is not a material property but rather a function of garment design and construction.

Penetration can occur through:

1. Material defects;
2. Seams;
3. Sleeves;
4. Pant legs;
5. Zippers, button holes or other enclosures;
6. Neck or head openings; and
7. Porous material.

Aerosol particulates, mists, gas, and vapors have the greatest penetration ability. Penetration can be prevented by:

1. Stitched and lapped or sealed areas;
2. Self-sealing zipper and overlap flap;
3. Hood with elastic sealed connection;
4. Elastic wrists and ankles;
5. One-piece suit; and
6. Taping seams and openings such as ankles, wrists, and zippers.

The significance of penetration depends on skin absorptivity and the following contaminant characteristics:

1. Toxicity;
2. Concentration;
3. Physical phase; and
4. Exposure route.

Use of a garment constructed of an impenetrable material can cause the possibility of heat stress because outside air is not allowed to penetrate the material; thus, little air moves within the garment. Cooling devices (e.g., ice vests) are not always effective or efficient.

Permeation (i.e., chemical movement at the molecular level through the material) occurs once the chemical has broken through the material. Because movement is by molecular diffusion, movement is microscopic and unnoticeable by the unaided eye. The contaminant, which can condense inside the material, will tend to reach an equilibrium concentration gradient.

Permeation rate, the rate of chemical movement through the material once breakthrough has started, can be very fast or very slow. Permeation rate is:

1. Inversely proportional to material thickness (discounting fillers);
2. Directly proportional to contaminant concentration gradient; and
3. Directly proportional to the amount of direct contact with the contaminant.

Chemical resistance of the protective materials is based on laboratory degradation or permeation tests. Laboratories perform these tests at room temperature; higher temperatures may decrease permeation time and rate. These data are approximate values because manufacturers' products, even products made of the same material, can have different properties. In addition, considerations should be given to the following facts:

- Eventually all chemicals pass or permeate through protective materials, and this can happen without any visible indications;
- A material may protect a worker well against one chemical but poorly against another; no single material is an absolute barrier against all chemicals;
- Garments that look alike do not necessarily possess identical protective qualities; and
- When a material starts to absorb a chemical, the chemical will continue to permeate through the material even though the material may not be in direct contact with the chemical.
- Specific considerations for glove, suit and boot selection include the following:
  - Hands will probably come in contact with the greatest variety of contaminants;
  - Gloves generally need to withstand longer exposure times;
  - Gloves need to be flexible because intricate work is usually done with the hands;
  - Inexpensive disposable suits can be worn over fully encapsulated suits to reduce contamination of the underlying suit;
  - Garments that workers do not dispose of must be decontaminated;
  - Boots must withstand long exposure times; especially if workers must stand in liquid; and

- Physical and psychological stress caused by the garment, especially the fully encapsulated suits, which can cause the wearer claustrophobia.

Chemical protective clothing will be required whenever the potential exists for exposure to hazardous concentrations of aqueous, solid, particulate and/or gaseous contaminants. In many instances, chemically protective clothing will be used in conjunction with respiratory protective devices. Used together, combinations of these PPE will offer different levels of protection (i.e., Levels A, B, C, and D). The appropriate level of protection selected will be a function of the potential concentrations of the contaminant(s), the forms in which they are present, the route(s) of potential exposure (i.e., inhalation, skin absorption, ingestion, eye or skin contact, etc.), and the employee's work requirements and task-specific conditions.

The Site Health and Safety Plan will outline the levels of protection required of each individual for each task to be performed. The levels of protection will be assessed using site-specific chemical and physical data. The selection of PPE will be performed using guidelines in documents such as "Personal Protective Equipment for Hazardous Materials Incidents: A Selection Guide"<sup>2</sup> and "Guidelines for the Selection of Chemical Protective Clothing"<sup>3</sup>. The MFG Site Safety Officer will be responsible for determining when conditions warrant upgrading or downgrading the level of protection. This determination will be made on the basis of "action levels" established in the Site Health and Safety Plan.

The Site Health and Safety Plan will also outline decontamination and disposal procedures, donning and doffing procedures, etc., for chemically protective clothing. Employees will inspect protective clothing prior to use to ensure that it is in proper condition. Use of protective clothing with structural defects is prohibited. If defects are detected, the protective clothing will be exchanged. In general, gloves, outer boots, and disposable coveralls will be replaced daily. If they become damaged, they will be replaced immediately.

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<sup>2</sup> NIOSH, 1984

<sup>3</sup> ACGIH, 1987, Third Edition.

## **F-6.0 Respiratory Protection**

The use of respiratory protection is specified under 29 CFR 1910.134. The primary objective of this protection is to limit employee exposure to harmful atmospheric conditions. Potential exposure will be initially limited by engineering control measures, to the extent practical. When effective engineering controls are not feasible or effective, appropriate respiratory protection will be used.

MFG has developed the following Respiratory Protection Program (RPP) to comply with 29 CFR 1910.134(a)(2). It is the responsibility of the employee to use the provided respiratory protection in accordance with the instructions and training provided by the manufacturer, OSHA training courses, Site Health and Safety Plans, etc. The majority of this section is oriented to the selection, use, maintenance, etc. of air-purifying respirators (APRs), or Level C respiratory protection. Additional instruction, training, etc. for care and use of supplied air respiratory equipment (e.g., Levels A and B of respiratory protection) will be included in Site Health and Safety Plans, as appropriate.

### **F-6.1 Standard Operating Procedure for the Selection and Use of Respirators**

The document "*NIOSH Respirator Decision Logic*"<sup>4</sup>, or equivalent, will be used as guidance for selecting appropriate levels of respiratory protection. Outside consultation, manufacturers' assistance, and other recognized authorities may be consulted if there is any doubt regarding proper selection and use.

### **F-6.2 Respirator Selection**

Respirators will be selected on the basis of hazards to which the worker may be potentially exposed. All selections will be made using site-specific chemical and physical data. The selection process will be documented in the Site Health and Safety Plan.

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<sup>4</sup>

NIOSH, 1987; Publication No. 87-108

### **F-6.3 Instruction and Training**

Employees will be instructed and trained in the proper use of respirators and their limitations. Training will provide the employee an opportunity to handle the respirator, have it properly fitted, test its face piece to face seal, wear it in normal air for a long familiarity period, and finally wear it in a test atmosphere. Employees will receive fitting instructions, including demonstrations and practice in how the respirator should be worn, how to adjust it, and how to determine if it fits properly.

Training in the proper use and limitations, maintenance, and storage, fitting, donning, doffing, etc., of respirators will be initially received by employees in an OSHA off-site hazardous materials health and safety course. At a minimum, these skills will be maintained by attendance at an annual refresher course.

Respirators will not be worn when conditions prevent a good face seal. Such conditions may be growth of a beard, sideburns, a skull cap that projects under the face piece, or temple pieces on glasses. No employees who are required to wear respirators may wear beards. Also, the absence of one or both dentures can seriously affect the fit of a face piece. To assure proper protection, it is the employee's responsibility to check the face piece fit each time the employee puts on the respirator. This will be done by following the manufacturer's face piece-fitting instructions.

Employees who may be required to wear respirators will be qualitatively fit-tested on an annual basis. However, under certain work situations, it may be necessary to perform quantitative fit testing. Fit testing documentation will be maintained in the corporate files.

### **F-6.4 Cleaning, Disinfection, and Storage**

Where practicable, respirators will be assigned to individual employees for their exclusive use. Employees will be responsible for regularly cleaning and disinfecting their respirators. Respirators issued for the exclusive use of one employee will be cleaned after each use, or more often, if necessary. Respirators used by more than one employee will be thoroughly cleaned and disinfected after each use. Respirators will be cleaned and disinfected per the manufacturer's instructions.

Employees must store their respirators to protect against dust, sunlight, heat, extreme cold, excessive moisture, or damaging chemicals. Protection against mechanical damage will also be the responsibility of the employee. Respirators will be stored so that the face piece and exhalation valve will rest in a normal position to prevent the rubber or plastic from reforming in an abnormal shape.

#### **F-6.5 Inspection**

Employees will be responsible for the routine inspection of their respirators. Respirators will be inspected for wear and deterioration of their components before and after each use. Special attention will be given to rubber or plastic parts. The face piece, especially the face seal surface, headband, valves, connecting tube, fittings, and canister connections must be in good condition. At a minimum, respirators will be inspected during the annual fit test procedure. If defects are detected, the respirator will be repaired/replaced. Inspection of the respirators will be documented. These inspection records will be maintained in the corporate files.

#### **F-6.6 Surveillance**

Appropriate surveillance of work area conditions (e.g., ambient air monitoring, personal monitoring, etc.) and degree of employee exposure or stress will be performed per the Site Health and Safety Plan.

#### **F-6.7 Program Evaluation**

Regular inspection and evaluation will be performed to assess the continued effectiveness of the RPP. The Corporate Health and Safety Director may make periodic inspections of employee respirators to ensure compliance with the cleaning, disinfection, storage, inspection requirements. In addition, the Site Safety Officer may make periodic audits of job sites to ensure compliance with the RPP. The evaluation records will be maintained in the corporate files.

#### **F-6.8 Medical Monitoring**

Employees will not be assigned to tasks requiring use of respirators unless it has been determined that they are physically able to perform the work and use the equipment. The respirator user's medical status will be reviewed annually.

#### **F-6.9 Certification**

Respirators will be MSHA- or NIOSH-approved. Supplied air will meet or exceed Grade D breathing air specifications. A small, backup SCBA (escape pack) will be carried by personnel when using an SCBA or air-line respirator.

**APPENDIX F-1**

**Levels of Protection**

## LEVELS OF PROTECTION

Personal protective equipment is generally divided into four categories based on the level, or degree, of protection provided. The following are meant to serve as guidelines which can be used to select the appropriate level of protection; optional equipment is not included.

### LEVEL C

- Disposable Tyvek® coveralls (exchanged when heavily soiled or after breaks, at least once per work day);
- Work gloves (disposable nitrile or cotton, depending on task);
- Steel-toe work boots (conforming to ANSI Standard Z 41.1);
- Hard hats (conforming to ANSI Standard Z 89.1);
- Safety goggles (conforming to ANSI Standard Z 87.1);
- Hearing protection (when excessive noise is present); and
- Full-face or half-face respirator with a high efficiency particulate air (HEPA) cartridge filter (conforming to ANSI Standard Z 88.2).

### MODIFIED

**LEVEL D** A work uniform affording some skin protection; used mainly during sampling and decon.

Blue jeans, shirt with 4" sleeves.

Safety glasses or sunglasses.

Hearing protection.

Gloves: chemical resistant.

Boots: steel-toed.

Hard hat.

**LEVEL D** A work uniform affording minimal protection; used for nuisance contamination only.

Blue jeans, shirt with 4" sleeves.

Boots: steel-toed.

Hard hat.

**APPENDIX F-2**

**Outline For Selecting Respiratory Protective Devices**

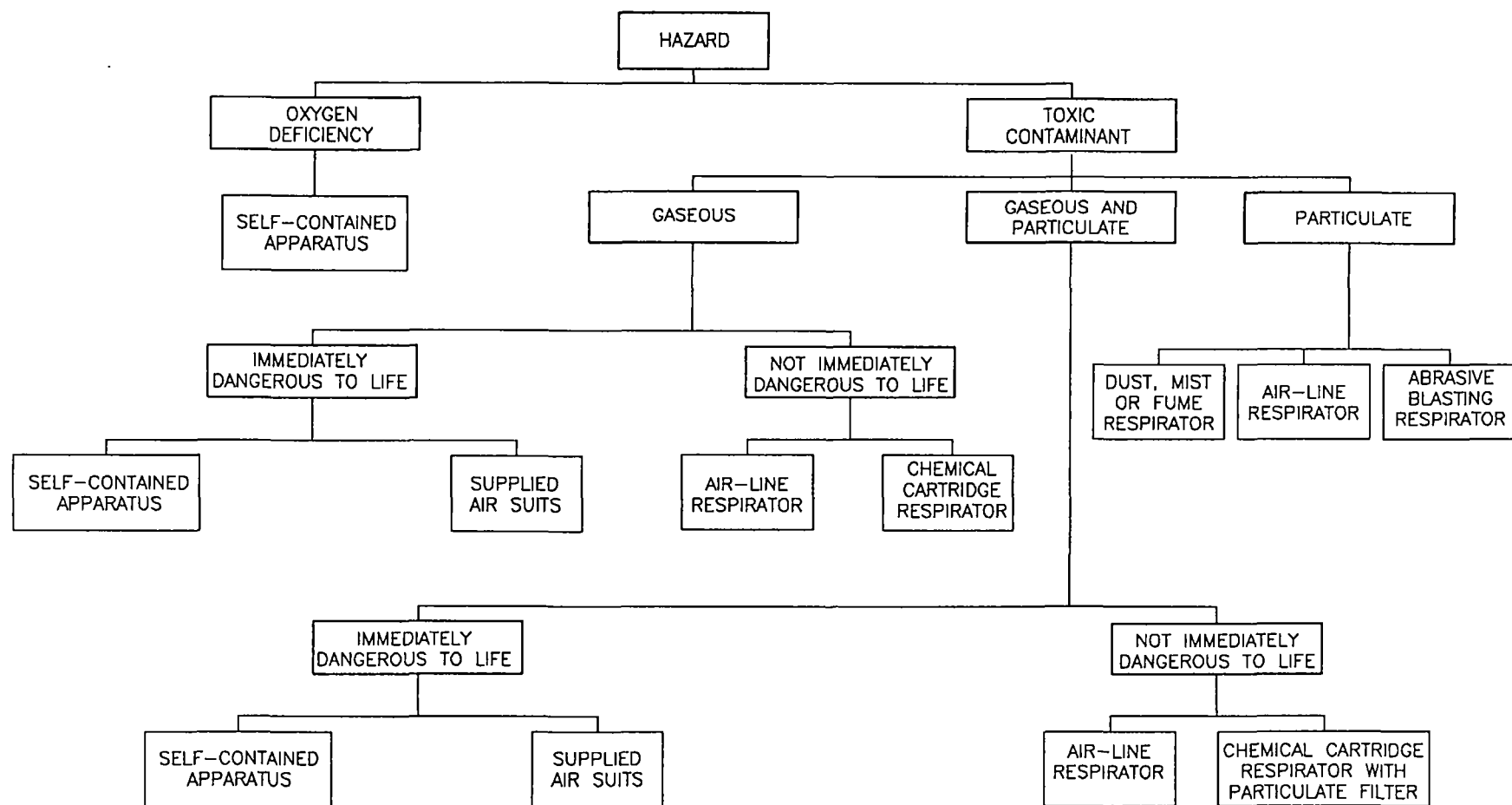


FIGURE 1  
RESPIRATOR DECISION  
FLOW DIAGRAM

PROJECT: 0000	DATE: FEBRUARY 2000
REV:	BY:PW CHECKED: PSW

**MFG, Inc.**

consulting scientists and engineers

**APPENDIX F-3**

**Respirator Fit Test Record**

## RESPIRATOR FIT TEST RECORD

MFG, Inc.

A: EMPLOYEE: \_\_\_\_\_  
SOCIAL SECURITY NO: \_\_\_\_\_  
EMPLOYEE JOB TITLE: \_\_\_\_\_

B: RESPIRATOR TYPE: \_\_\_\_\_  
MANUFACTURER: \_\_\_\_\_  
MODEL: \_\_\_\_\_  
SIZE: \_\_\_\_\_

C. CONDITIONS WHICH COULD AFFECT RESPIRATOR FIT:

BEARD	FACIAL SCAR
MOUSTACHE	GLASSES

COMMENTS: \_\_\_\_\_

D. FIT CHECKS:			
NEGATIVE PRESSURE	PASS	FAIL	NOT DONE
POSITIVE PRESSURE	PASS	FAIL	NOT DONE

E. FIT TESTING:

QUANTITATIVE	ISOAMYL ACETATE	IRRITANT SMOKE
	QUALITATIVE	QUALITATIVE
FIT FACTOR	PASS	PASS
	FAIL	FAIL

COMMENTS: \_\_\_\_\_

F. ACKNOWLEDGMENT

In accordance with the Corporate Respiratory Protection Program, I understand that I am responsible for:

Regular use of my respirator whenever there is a possibility I may be exposed to air contaminants;  
Cleaning, disinfecting, inspecting and storing my respirator; and  
Reporting respirator malfunction to my supervisor.

EMPLOYEE SIGNATURE: \_\_\_\_\_ DATE: \_\_\_\_\_  
FIT TESTED BY: \_\_\_\_\_  
SIGNATURE OF FIT TESTER: \_\_\_\_\_



**APPENDIX G**

**MFG MEDICAL SURVEILLANCE PROGRAM**

## **MFG MEDICAL SURVEILLANCE PROGRAM**

### **G-1.0 Policy**

All employees potentially exposed to occupational health hazards will participate in the medical monitoring program, with no exceptions.

### **G-2.0 Purpose**

The medical monitoring program is designed to assess and monitor worker's health and fitness both prior to employment and during the course of work, to provide emergency and other treatment as needed, and to keep accurate records for future reference. MFG's medical program is designed to meet or exceed the OSHA requirements for workers that handle hazardous substances. The medical monitoring program provides for pre-placement, annual, periodic, post exposure and separation examinations for all MFG employees potentially exposed to occupational health hazards. MFG's medical program is managed by WorkCare, Inc. of Orange, California. WorkCare specializes in providing oversight of medical surveillance programs. Their website address is: <http://www.workcare.com>.

### **G-3.0 Requirements**

Site-specific medical monitoring programs will be developed based on specific needs, location, and potential exposures of employees at the site. This determination is made by Corporate Health and Safety Director, who is tasked with overall program management and quality control.

#### **G-3.1 Pre-Placement Medical Examinations**

The purpose of the pre-placement medical exam is twofold: (1) to determine the employee's fitness for duty, including the ability to work while wearing protective equipment; and (2) to provide baseline data for comparison with future medical data. A pre-placement medical examination is necessary prior to the employee initiating field work.

Termination physicals from previous employment may be accepted in lieu of MFG's pre-placement exam, within the constraints of exam content and time frame.

Pre-placement medical examinations may vary a great deal in content depending upon the nature of the job assignment. Pre-placement physicals for technical personnel may include the following components:

1. History and physical;
2. Vision - Titmus;
3. Audiogram;
4. Pulmonary Function Test (PFT);
5. Electrocardiogram (EKG);
6. Chest X-rays (with interpretation);
7. Blood Chemistry Panel;
8. Complete Blood Count (CBC);
9. Urinalysis with Microanalysis (UA);
10. Urine heavy metals (arsenic, cadmium, mercury) screen - optional;
11. Blood lead/ZPP - optional;
12. Tetanus booster - optional;
13. Respirator Clearance Form; and
14. Medical Clearance Form.

### **G-3.2 Annual Medical Exams**

The annual physical exams will be equivalent to the pre-placement exam except for the history, which will include any relevant information concerning possible exposures, symptoms, etc. occurring since the last physical. More frequent examinations may be necessary, depending on the extent of potential or actual exposure, the type of chemicals involved, the duration of the work assignment, and the individual worker's profile. Additional tests for specific chemical exposures will be added to the annual exam when deemed appropriate by the physician.

### **G-3.3 Periodic Medical Exams and Supplemental Medical Monitoring**

Periodic and supplemental medical monitoring examinations will be used in conjunction with pre-placement screening exams and annual physicals to compare sequential medical reports with baseline data; thus determining biological trends that may mark early signs of adverse health effects, and thereby facilitate appropriate protective measures. A baseline level for the site-specific compound of potential concern must be established prior to the employees beginning field work. The appropriate biological indicator and test method (e.g., blood analysis for lead, urine analysis for mercury) will be determined prior to initiating supplemental testing.

The frequency and content of examinations will vary, depending on the nature of the work and exposures. Periodic screening exams can include:

Interval medical history (focusing on changes in health status, illnesses, and possible work-related symptoms);

Review of the worker's interval exposure history, including exposure monitoring at the jobsite; and

Physical examination.

Additional site-specific supplemental monitoring and medical testing may include:

- a. Pulmonary function test;
- b. Audiometric tests;
- b. Vision tests; and/or
- d. Blood and urine tests for heavy metals or other compounds, when indicated.

#### **G-3.4 Termination Medical Exams**

A separation exam will be scheduled for employees who are participating in the medical surveillance program. The separation exam will be similar to the pre-placement exam, with the exceptions of the medical history (updated since the last physical), no chest x-rays will be taken and an EKG will not be given. The occupational physician will certify any deleterious effects arising from employment at MFG. Every effort will be made to encourage employees to complete a separation exam. If an employee refuses to take a separation exam, the "Exit Physical Waiver" form shall be completed by the employee at the time of separation.

#### **G-3.5 Lead Examination**

According to the OSHA lead standard (29 CFR 1910.1025), a medical surveillance program must be instituted and medical examinations and consultations must be made available to every employee potentially exposed above the lead action level ( $30 \text{ ug/m}^3$ , averaged over an 8-hour period) for more than 30 days total per year, regardless of continuity of days. MFG shall assure that WorkCare, the physician and/or medical clinic maintains medical records for at least 40 years, or duration of employment plus 20 years, whichever is longer.

Prior to job commencement, a physician will evaluate and document the worker's baseline health status by collecting medical, environmental, and occupational histories; by performing a physical examination; and by requesting physiological and laboratory tests appropriate for the anticipated occupational risks.

The medical examination, both initial and periodic, will include the following:

- A thorough physical examination that pays particular attention to the hematologic, gastrointestinal, renal, cardiovascular, and neurological systems;

- An evaluation of pulmonary status to determine whether the worker is capable of wearing a respirator;

- Blood pressure measurement;

A blood sample to determine blood lead levels, hemoglobin and hematocrit, blood urea nitrogen, serum creatinine, and zinc protoporphyrin (ZPP). Blood lead/ZPP tests will be repeated every 6 months, or more frequently if required by the HASP, for employees continuously assigned to lead-contaminated job sites;

A routine urinalysis with microscopic examination;

Pregnancy testing or male infertility testing, if requested by the worker; and

Any laboratory or other test that is recommended by the examining physician.

### **G-3.6 Employee Exposure Monitoring**

Hazardous waste work involves potential exposure to a wide variety of potential hazards. In the case of chemical exposures and some physical hazards such as noise, these exposures may be measured and quantified. An employee will receive additional medical monitoring upon notifying the employer of symptoms consistent with overexposure to on-site chemicals, or if any employee is exposed to on-site chemicals at concentrations in excess of the permissible exposure limit (PEL) without protection.

Exposure monitoring may be accomplished for the purpose of establishing or verifying work area protection levels, to designate appropriate work zones, and to supplement or trigger medical monitoring requirements. This monitoring may be carried out by monitoring each individual's exposure or by conducting representative monitoring for specific work tasks or groups of employees exposed to similar hazards under similar conditions.

All exposure monitoring results will be communicated to the individual monitored or to the representative group of employees, as appropriate. Written monitoring reports will be provided to the employee and a copy will be maintained in the employee health and safety file. The results will also be provided to the physician who carries out the medical monitoring examinations for the Company and to WorkCare. Exposure monitoring records will be maintained for a period of 30 years, and may be stored on microfilm or microfiche, as necessary.

Employee exposure monitoring will be carried out in accordance with NIOSH standardized methods of sampling and analysis, or other equivalent methods. These methods specify quality assurance/quality control (QA/QC) provisions for maintaining

sampling and analytical integrity, precision, and accuracy. Samples will be analyzed by a laboratory accredited by the American Industrial Hygiene Association (AIHA).

#### **G-3.7 Examining Physician's Report**

The examining physician's written report will include the physician's opinion regarding the employee's ability to wear protective clothing and respiratory protective equipment. In addition, any medical condition that is detected via the examination process that is believed to be a direct result of the work environment will be included in this report. The examining physician's opinion regarding the individual's work restrictions will be documented in this report. The restrictions noted by the physician will be reviewed by MFG's Corporate Health and Safety Director. This information and decision will be summarized on a Fitness for Duty form.

The examining physician will be required to notify the employee of any conditions which are detected during the exam whether these conditions are deemed to be related to their work environment or not. In addition, the examining physician will provide the employee with a written copy of the examination and test results. These records may also be provided to the employee's personal physician upon written release by the employee.

#### **G-4.0 Recordkeeping**

An employee's medical records are considered personal and confidential and are kept separate from other personnel records. Records generated by the Medical Surveillance Program must be preserved and maintained by WorkCare, the physician and/or medical clinic for at least 30 years after termination of the employee's employment with MFG. The original records are currently stored at each medical clinic and copies are maintained by WorkCare. The physician's written reports, x-rays, exam data, and test results make up the employee's confidential medical record. Project Managers will be made aware of medical information that is related to their employee's fitness for duty only.

#### **G-4.1 Additional Information**

All examining physicians will be provided copies of 29 CFR 1910.120, any pertinent employee exposure data available since the employee's last exam, the employee's job description, the employee's exposure levels or anticipated exposure levels, and a description of any PPE used or to be used. Each Office Health and Safety Coordinator is responsible for communicating this information to WorkCare and the examining physician.

## PHYSICAL EXAMINATION REQUIREMENTS

2002

Test Component	Baseline	Annual	Termination	Potential Over Exposure
1. History and Physical	Yes	--	--	Specific
2. Update Occupational/Medical History	--	Yes	Yes	Yes
3. Complete Physical Exam by Physician	Yes	Yes	Yes	Yes
4. Vitals (Ht., Wt., BP, Temp, etc.)	Yes	Yes	Yes	Yes
5. Audiometric Exam	Yes	Yes	Yes	If Indicated
-Documentation of STS	N/A	Yes	Yes	If Indicated
6. Vision Test with Titmus	Yes	Yes	No	If Indicated
7. Electrocardiogram (EKG)	Yes	Age <40 every 3 yrs Age 40-50 every 2 yrs Age >50 every year	No	N/A
8. Chest X-Ray (2 views with Interp)	Yes	Every 3 yrs	No	If Indicated
9. Pulmonary Function Test (PFT)	Yes	Yes	Yes	If Indicated
10. Blood Chemistry Panel	Yes	Yes	Yes	If Indicated
11. Complete Blood Count (CBC)	Yes	Yes	Yes	If Indicated
12. Urinalysis with Microanalysis	Yes	Yes	No	If Indicated
13. Urine Heavy Metal Screen	If Required	If Required	If Required	If Required
14. Tetanus Booster (every 10 yrs)	If Indicated	If Indicated	No	If Indicated
15. Blood Lead and ZPP	If Required	If Required	If Required	If Indicated
16. Medical Clearance Form	Yes	Yes	Yes	Yes
17. Respirator Certification Form	Yes	Yes	No	Yes

## APPENDIX H



**APPENDIX H**

**STANDARD OPERATING PROCEDURES**

## **PROTOCOL NO. 1 PERSONAL AIR MONITORING**

### **1.0 INTRODUCTION**

This document describes procedures to be followed during personal air sampling performed during gypsum stack roads remediation activities at the Simplot Plant Area of the Eastern Michaud Flats Superfund Site.

The procedures presented herein are intended to serve as guidelines. Appropriate modifications of the procedures may be made, and, if so, will be approved in writing by the Project Manager and the EPA. Personal air sampling will be conducted by the construction contractor under the supervision of Simplot's on-site representative.

### **2.0 PERSONAL AIR SAMPLING PROGRAM**

Personal air sampling will be conducted during excavation and grading of the gypsum materials. The sampling program will monitor those individuals that are at the highest risk and who perform duties that involve exposure to the pit solids. At a minimum, sampling will be performed every third day with one sample per job function that involves potential exposure to dust from the gypsum materials (e.g., grader operator and ground crew).

Personnel will be monitored for a full shift, at least 8 continuous hours of the work day. Full-shift personnel samples will be representative of the monitored employee's regular, daily exposure as determined by the Contractor's Health and Safety Coordinator.

### **3.0 SAMPLING PROCEDURES**

Following is discussion of the anticipated sampling procedures. Actual sampling procedures shall be specified in the construction contractor's Health and Safety Plan.

Calibration of the personal air sampling filter cassettes (0.8  $\mu$ m Mixed Cellulose Ester Filters 37 mm or equivalent) will be performed in line with the sampling pump. The flow rates should be set at approximately 2 liters per minute. Total dust samples [total suspended particulates (TSP)] will be collected on pre-weighed 5  $\mu$ m PVC 37 mm filter cassettes. Total dust samples should be calibrated at a flow rate

between 1.5 to 2 liters per minute. The filters will be attached to the primary calibrator and three calibration runs will be made and averaged for an initial (pre) calibration. The soap bubbles should be flat with no deformities present to be considered a good calibration run. The pre-calibration information will then be written on the sampling data sheet. The filters should be checked to see that they lay flat against the backup pad. If the filters are not flat or contain a deformity then the filters should be discarded.

The sampling pumps will be attached to an employee's belt with the Tygon<sup>®</sup> tubing stretching behind their back so that the filter cassette hangs face down from the individual's collar or within the breathing zone. One hour after the sampling pump is attached to the individual, the flow will be checked to see if the flow is maintained to within 10 percent of the original flow. If the flow is not within 10 percent, the pump will be replaced or the flow rate adjusted to within 10 percent of the original setting. Calibration checks should continue periodically throughout the day.

The sampling pumps should remain on throughout the entire work day. The individual's exposure should be monitored continuously throughout the day as long as the individual remains on the site. If the individual should be required to leave the work site, the pump should be shut off and the duration of the pump down time documented. A record of the individual's activities during the day should be noted on the sampling data sheet. The filters should be checked so that they do not exceed 2 mg of dust during the day. If overloading should become a problem, the original filter will be replaced with a clean second filter.

At the end of the day, the sampling pumps will be shut off and the total sampling time recorded on the sampling data sheet. The pumps will go through post-calibration with a primary calibrator. Again, three runs will be made and averaged for a final post-calibration, which will be recorded on the sampling data sheet. The day's temperature and atmospheric pressure should be recorded on the sampling data sheet, with a standard temperature and pressure correction factor used when necessary to determine the correct volume collected.

Sampling and analytical methods will follow the National Institute for Occupational Safety and Health (NIOSH) methods for the analyte constituents and total dust (TSP). A blank quality assurance (QA) sample for each analyte sampled will be sent for each ten samples delivered to the laboratory. Typically a one-week turnaround will be used, unless a longer turnaround time is authorized by the Corporate Health and Safety Coordinator, the Resident Project Representative and the Project Manager.

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